# Environmental Education ***about***, ***in*** and ***for*** the Environment

## The case of two secondary schools in Ethiopia

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# Abstract

**Introduction**: Ethiopia is one of the most severely affected climate change prone countries and among the most at risk in future consequences of climate change and related disasters, such as land degradation, deforestation, drought, rainfall variability and climate borne disease (Bangay, C. and Blum, N., 2010). Thus, education as one of the tools to combat various environment related problems, to assess what is being done in education particularly as to how climate related problems are being treated in formal education system of the country sounds sensible. Thus, this study investigated how different schools which are situated in different geographical and climate areas treat environmental education under the context of a centrally prepared curriculum which is being implemented uniformly across the entire country while environment related problems and concerns vary from one area to another.

**Aim**: The overall aim of this study is to see the relevance of environmental lessons incorporated in school subjects in addressing local environmental problems; to investigate to what extent the local environment is being used as a source and medium of environmental education *about, in* and *for* the environment; and to find out the possible challenges and factors that affects the practice of environmental education *about, in* and *for* the local environment in this context.

**Study design**: The study employed comparative research design using different qualitative methods

**Methods**: The data were collected through focus group discussion, semi-structured interviews, and observation and students' questionnaire.

**Finding**: The study in general found out that schools are teaching students mainly *about* the general knowledge of the global and national environmental issues merely based on what is presented in the syllabus. Local specific environment related problems, however, are found different where School A and B are located. Nevertheless, the finding shows that the current practice of environmental education in the two schools did very little to teach students *about, in* and *for* the local environment. There are hardly any locally contextualized environmental lessons and skills taught in the schools which are relevant *for* the surrounding local environment. The study also found that unfavorable learning environment regarding infrastructure, socio-economic, large class size, high teaching loads, centrally designed

curriculum, lack of initiatives, teachers' related factors, students' family background and local community factors as well as poor coordination between different stakeholders are some of the factors that affect the practice of environmental education and the responses to local environmental needs.

**Conclusion**: The nature of environmental problem solving actions start from locally based actions on the bases of the socio-ecological knowledge and situations of a place, which, in the process, expands to national and global scale of protecting, conserving and rehabilitating the common good, the bio-physical environment. Thus, teaching students *about* the general environment without providing the knowledge and skills necessary to know and experience their local environment is missing the point. An environmental education detached from the local environment knowledge and skills is ineffective to enable students develop favorable attitude and pro-environmental behavior *in* and *for* their local environment.

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# Acronyms

| | |
|---|---|
| EFA | Education for All |
| FGD | Focus Group Discussion |
| EGSECE | Ethiopian General Secondary Education Certificate Examination |
| ESD | Education for Sustainable Development |
| EPA | Environment Protection Authority |
| FAO | Food and Agriculture Organization |
| FDRE- PCC | Federal Democratic Republic of Ethiopia Population Census Commission |
| GNP | Gross National Product |
| MOE | Ministry of Education |
| MDG | Millennium Development Goals |
| NGO | Non-Governmental Organization |
| TVET | Technical and Vocational Education and Training |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UN-HABITAT | United Nations Human Settlement Programme |

# Contents

# 1 Introduction

## 1.1 Background

Every time, the moment I turn on any of the news screens to see news of the day, many of the news aired are about violence, terrorism, wars, conflicts, floods, heavy storms and nuclear threats. The statistics about the number of people dead, injured and displaced from their home are all shocking to listen to. If the news is slightly different at face, then it might be about economic crisis, unemployment, disease, corruption, drug trafficking, migration and drought. What is more painful to realise is that most of these situations - one way or the other - are consequences of human actions or in Beck's term, 'manufactured risks' (Beck, 1992). For instance, in the last two decades, over 3 million people lost their lives caused by natural disasters (Landon, 2006). Beck's concept of 'Manufactured risks' is translated by Ritter M. (1992:2) as,

> *For Beck the consequences of scientific and industrial developments are a set of risks and hazards, the likes of which we have never previously faced. These dangers can for example, no longer be limited in time- as future generations are affected. Their special consequences are equally not amenable to limitations- as they cross national boundaries: Unlike in an earlier modernity, no one can be held accountable for the hazards of the risk society.*

Then, the basic question has to be when and where this chaos is going to end? Where are we heading having all these chaos? What are the very deep root causes of all these social, economic, political and environmental problems that the world has faced? Trying to answer these questions may not be an easy task, but most of the problems seem to share a similar ground at their initial stage. Intellectuals from different corners of disciplines put poverty in all its forms at the forefront of all the possible root sources of the various social, political, environmental and more importantly economic problems.

It is a mere fact that poverty, one way or another, is highly interconnected with resources - both human and natural resources. Resources, especially natural resources are limited in amount and some kinds of them are non-renewable. Fekede (2005) argues that the blame for the current natural resource destruction and environmental degradation seen at the global level goes to the poor and wealthy nations. Fekede (2005:35) describes it as, "The wealth of industrialized countries enables people to consume huge quantities of resources (...).On the other hand, extreme poverty causes increasingly large number of people to overexploit the

land which results in desertification or loss of rainforest (…)." On top of these, population explosion, which seems contrary to natural resource growth, is an ever increasing phenomenon which should, in principle, be accompanied by growth in resource supply. It is in between the growth of population and our limited resource supply capacity that many of the problems and conflicts (resource or poverty born) emanates. It seems within the context of all these contemporary worldwide problems – which forecasts the possible fate of the future, that the multifaceted idea of Education for Sustainable Development (ESD) takes the centre stage of the ESD decade (2005 - 2014) (UNESCO, 2005).

Since the start of modern education, education has been trusted as one of the potential human assets and mechanisms to tackle many of the social, economic and political problems we have seen so far. ESD is one instance of such belief that education can play indispensable roles in changing the minds of children - the very first and key step to move towards sustainable development (Damtew, 2008). Accordingly, environmental education has been given an increasing attention at the global level - as a result of which - various subjects at different levels of schooling are made to incorporate environment related contents so as to equip learners with relevant knowledge and skills necessary for protecting and conserving the environment. Thus, education for the environment is one of the renewed brand mechanisms to confront the multifaceted consequences of climate change and various forms of environmental degradations seen today.

As studies have confirmed, the consequences of climate change seem more chronic to low income countries for the same reason that they have low protective material and financial capacity. As Beck (1992: 35) said, "like wealth, risks adhere to the class pattern, only inversely: wealth accumulates at the top, risk at the bottom. To that extent, risks seem to strengthen, not abolish, the class society. Poverty attracts an unfortunate abundance of risks. By contrast, the wealthy (…) can purchase safety and freedom from risk." Beck (1992) argues that these 'contemporary risks' are characterized as 'create winner' and produce social inequalities with in which the risk producer (the wealthy group) can afford to manage and protect the risks while the poor remain more vulnerable to the consequences of the 'manufactured risks'.

Ethiopia is one of the countries which can be categorized within the domain of losers in the contemporary risks especially in relation to environmental disasters and degradation. But still, despite recognizing the various forms of environmental problems in the country, little

attention is paid to education as one possible tool for sustaining the future through awareness, knowledge building, attitude and behavioural changes in all walks of life (Fekede, 2009). It is, therefore, taking the severity of the environmental problems in the country in to account that the researcher questioned about the practice of environmental education in relation to its interconnectedness and relevance for the local environmental realities and problems. This study, accordingly, focuses on investigating the manner in which the three interrelated concepts of environmental education - Environmental education *about, in* and *for* the environment - are being treated in actual teaching and learning processes of secondary schools in Ethiopia.

## 1.2 Statement of the Problem

Ethiopia, very recently, became the 2nd populous country in Africa with population size over 85 million people. The country's economy can be characterised as poor agrarian economy which is highly dependent on rain-fed subsistence agriculture and the agriculture sector contributes 45% of GNP and 85% of export earning of the country (Bekalo, 2001). According to the report of World Bank (2009), Ethiopia is one among the 12 short listed countries which are most at risk of future drought and low agricultural production as a result of seasonal rainfall variability and absence of enough rain. According to FAO (2010), the annual estimated deforestation reaches 141,000 hectare. In a similar story, 1.5 billion tons of soil is being eroded every year due to wind and water erosion (Bekalo, 2001). Besides, an ever increasing population growth is one of the future challenges of the country under its very limited resources capacity in terms of financial, technological and human capitals (UNESCO, 2010). In general, due to the cumulative impact of climate change and other related factors both human and natural; land degradation, soil erosion, deforestation, pollution, drought, etc. are recurrent events in the country which are costing both human life and a huge amount of financial capital for rehabilitation purpose.

The entire environment related treats indicated above call the urgency of education for the environment. It seems with the understanding of this concern that The Ministry of Education considered environmental education as one focus area in the policy document and subsequently designed a curriculum that incorporates environmental education from primary through higher education level in the form of separate subject and infusion or in an integrated approach form. In primary school there is a separate subject called *Environmental Science*

which is being given from grade 1-4. However, beginning from second cycle primary school (grade 5-8) through secondary school (grade 9-12) and higher learning institution, environmental education is given in the form of infusion so that environment related issues are incorporated in various subjects (as unit and sub-units) such as, biology, geography, chemistry, social studies, civic and ethical education, and English. In a similar way, the country's environment policy document (EPA, 2002) also prescribe the role of formal education system on environmental education and awareness as*:* "To promote the teaching of environmental education on a multidisciplinary basis and to integrate it into the on-going curricula of schools and colleges and not to treat it as a separate or additional subject, though this should be done at the tertiary level."

However, there are various challenges that schools and teachers face while trying to meaningfully translate the nationally designed curriculum in to the classroom teaching and learning processes. The challenges even get a bit worse when it comes to environmental education particularly with reference to the teaching of environment related lessons which are responsive to the local environmental challenges. This could be, as some scholars argue, due to the influence of having a centralised curriculum which is uniform across all secondary schools in Ethiopia while environment related problems vary from place to place- which implies there is a need for locally relevant environmental knowledge and skills (Damtew, 2008). Similarly, 'the over loaded nature' of secondary school curricula is the other problem that could potentially reduce the role that schools contribute to equip learners with the necessary knowledge, desirable attitude and relevant skills to impact their local environment (Bangay & Blum, 2010).

In addition, due to the impact of a long standing traditional teaching-learning process and exam driven way of teaching that dominated Ethiopian education system, engaging learners in a kind of learning process that promotes critical thinking and problem solving activities may not be an easy task. As some studies confirmed (Damtew, 2008), the actual teaching and learning practice in most Ethiopian schools' classrooms seem teachers dominated and subject-centred teaching processes where teachers are considered as sole sources of knowledge while learners remained passive recipients and more exam-oriented. Thus, the pedagogical aspect of environmental education is also the other possible unclear issue that opens additional room for question.

Moreover, despite the common consensus among different stakeholders on the roles and importance of environment inclusive education, it is still a debateable issue as to how, what and in what form environment and climate change related issues should be incorporated and taught in schools. Teaching *about* the environment by integrating environmental issues in to different school curricula seems the dominant approach of addressing the issue to students. As stated in Coppola N. (1999), the rationale behind teaching *about* the environment is that the knowledge about the environment -'environmental literacy'- is 'a necessary pre-condition' to act in a responsibly behaviour manner in one's own environment. However, teaching about 'which?' environmental problems is the question that equally needs a critical scrutiny and answer while dealing with environmental education. In here, by 'which?', I am referring to the dilemma of choosing environmental problems and challenges that could range from the very local environmental problems until problems peculiar to Ethiopia as well as problems at the wider global context. Which environmental problems and challenges should be prioritized is an important question given the fact that we have centrally prepared curriculum uniformly implemented across all secondary schools in the country while environmental problems vary from place to place.

On the other hand, there are scholars who doubt the effectiveness of teaching *about* the environment to bring the desired attitude and behavioural changes - which are both an important ingredients that lead people to make action in favour of their environment. The major argument raised by these people is that though imparting knowledge is very basic, it is not enough to enable students to transform their knowledge into action in order to protect their environment and adapt to the consequences of climate change. For instance, Kibert (2000) as quoted by Yohannes (2007) said, "Knowledge and attitude had a weak correlation, while attitude and behaviour demonstrated a moderate correlation; and knowledge and behaviour revealed no relationship." In relation to this, Fekede (2005) argues that environmental education needs to go beyond mere knowledge formation process rather practically oriented environmental education should be practised so that students develop both the knowledge and skills as well as acquire desirable attitude towards the environment which are all-together important factors for them to act. In this regards, Taylor N., Littledyke M., Eames C. and Coll R. (2009:3) argued,

> *In the last few decades, there have been growing concerns that traditional environmental education (education **about** the environment) is limited in its scope and to effect the necessary attitudinal and behavioural changes needed if ecological degradation is to be reduced. Rather*

*rich learning experiences must also include learning **in** the environment and learning **for** the environment, or taking of actions to improve outcomes.*

As noted above, climate change, environmental degradation, natural disasters, drought, pollution, population, etc. are all the well-recognized issues- which are incorporated at the education policy level as well as at the school curricula level. However, according to some assessment studies conducted on environmental education in Ethiopia, what is going on beyond the environmental education policy level - policy implementation and effectiveness is questionable with a lot of gaps between the policy and the practice. (Dalelo, 2006 and 2009; Damtew, 2008).

Moreover, as it is earlier argued, knowledge alone, without actions, adds very little in preventing problems. Studies conducted in a similar area have confirmed that issues about environment, population and related topics are integrated in many of the school subjects in Ethiopian secondary schools though that does not bring positive behavioural changes among students due to various forms of limitations in implementation phase (Dalelo, 2009). In relative terms, due to the seriousness and devastating scale of environmental disaster in the country, environmental education should go beyond teaching for awareness and knowledge about the environment. Bangay, C. and Blum, N. (2010:2) argue that since developing countries are warmer, more vulnerable to rainfall variability, agriculture dependent economy and low financial capacity to mitigation and adaptation, climate change education should be an integral part of the education system rather than additional. Thus, in Ethiopia, where around 85% of the population live in rural area depending on rain-fed and subsistence agriculture, putting potential efforts on environmental education (education *for* the environment) should be the top priority to secure a long term and sustainable solution for the problems.

Thus, how students are learning with regard to climate change and environment related topics matters more than the mere presence of the issue at the policy level as well as at the school curricula level. As it is indicated at UNESCO (1994: VI*),* "It is not sufficient to «tell» students about ecology. Students must experience a curriculum which allows them to discover how they interact with the environment themselves. Only in this way will citizens the world over be able to make sound and responsible decisions concerning environmental issues."

To sum up, given all the above stated shortcomings, the researcher questions the following. To what extent multidisciplinary integration approach of environmental education is good

enough to acquaint students with environmental knowledge and skills necessary for desirable pro-environmental behaviour? How far environmental education teaching and learning process is relevant and responsive to address local environmental problems? How far the teaching and learning process go beyond class room activities and exposes learners with real life experience- learning *in* the environment as well as *for* the environment? Do teachers have the necessary knowledge and skills to adapt the centralised curricula into local contexts? Although all these questions mean a lot and demands a lot of time and huge financial and human capacities to be carefully studied, the questions still can be studied taking a case of one or two schools. Thus, this study investigated the core issues raised in the given questions particularly questions connected to the relevance of the environmental education for local environmental problems.

## 1.3 Theoretical Framework of the Study

This study is conducted to investigate the contextual relevance of environmental education *about, in* and *for* the environment. Hence, the importance of the pedagogical implication attached to the notion of place (context) is vital for the very reason that the essence of environmental education *in* the environment can only be real when students have direct interaction and experience with the local environment (place). Thus, considering the pedagogical meaning of 'place' as an important ingredient in the teaching and learning process of environmental education (place as a source of contents and as a medium of learning and teaching) demands a theoretical framework and backup to be meaningfully analysed in the course of this study. Similarly, finding a kind of pedagogy that emphasise the role of 'place' inclusive teaching and learning process is also equally important in the final analysis and discussion of the findings of this study. Accordingly, *critical pedagogy of place* and *place attachment theory* are felt pertinent by the researcher to be used as conceptual framework of the study - in which the data gathered during the field work are going to be analysed and discussed in line with this given theoretical framework.

Gruenewald (2003), who came up with the theory of critical pedagogy of place, argues why he coined the new pedagogy that entertains two important elements at a time, "Taking the position that "critical pedagogy" and "place-based education" are mutually supportive educational traditions, this author argues for a conscious synthesis that blends the two discourses into a critical pedagogy of place."

Critical pedagogy - which is originated from critical theory - lacks the ecological concern while it gives due emphasis on social experiences in connection to place. In a similar way, place-based education emphasises the ecological aspect of place while it gives very little room for the social aspect of place which is well underlined in critical pedagogy. Thus it is, according to Gruenewald 'the best of both words' which forms critical pedagogy of place. Manteaw (2011:34), on the bases of Gruenewald definition, describes critical pedagogy of place as follows:

> *Critical pedagogy of place posits two fundamental goals for education: decolonization and re-inhabitation. In decolonization, learners go through self-critical epistemological processes to gain personal awareness and understanding of local situations. This awareness and understanding of the local problems and their underlying causes result in a new desire and a new sense of empowerment to re-inhabit- to live well- in their places by exploring emancipator possibilities.*

'*Place attachment theory*' is the second chosen conceptual framework that backs up the analysis section of the study. We can't talk about people without mentioning the place they belongs to, without the place they live in, without the place they grew up. Giuliani (2003:138) stated the following about the emotional attachment that people have with places and possible roles that bond could play in their lives.

> *Indeed, not only do we acknowledge the existence of an affective bond with places, but also the importance that this can have in qualifying our existence, whether positively or negatively; and not just our individual private existence, but also the existence of the entire human groups. For better or worse, this has a far reaching implication. The feeling we experience towards certain places and to the community that the places help to define and that are themselves defined by the places,- home (family, relations, friends), workplace (colleagues), church (fellow worshipers), neighbours, city, country, continents - certainly has a strong effect in defining our identity, in filling our life with meaning, enriching it with values, goals and significance.*

People have strong emotional ties with their own places and the question lies on how this power of attachment between place and the people who live in a particular place be used as a resource for learning. This is the very rationale that justifies the choice of place attachment theory as one of the conceptual framework of this study. In this regards, Semken & Freeman, (2008:1043) explained,

> *Considered from the perspective of teaching and learning, sense of place defined as place meaning plus place attachment encompasses the cognitive (knowledge as place meaning) and affective domains (place attachment; attitudes and preferences as place meanings). It may also extend into the psychomotor domain by incorporating kinaesthetic skills learned or performed in specific physical places.*

Thus, in the discussion session of the findings of the study, the data gathered are going to be analyzed in line with the epistemological and ontological considerations and the major issues and principles of critical pedagogy of place and place attachment theory.

## 1.4 Purpose of the Study

The very intention of the study is to see how far the teaching of environmental education through multidisciplinary integration is being effective in bringing behavioural change to make students responsive to their local problem. Under this overall purpose, the study, in addition, looks at:

- ✓ The relevance of environmental lessons incorporated in school subjects in addressing local environmental problems;
- ✓ The methodological approach which is widely used in environmental education lessons: teaching *about, in and for* the environment.
- ✓ Whether or not teachers are aware of their responsibility to make environmental education lessons locally contextualized in order to help students understand their local environmental problems and thereby to enable them to be active participants in the process of solving their local environmental problems.

## 1.5 Research Questions

As indicated earlier environmental education is being given in Ethiopian secondary schools in an integrated form with other subjects such as Geography, Biology and English with different approaches. Although there is uniformity in environment related problems across the country, still there are problems typical to certain places. Since the purpose of this study is to see the contextual relevance of environment education in addressing local environmental problems, the study will investigate the case of two different schools - one situated in urban centre and one in rural area. Given this context, the study seeks to answer the following questions:

- ✓ To what extent is an integrated environmental education approach effective in helping learners develop knowledge, attitude, and pro-environmental behaviour?
- ✓ To what extent are environmental problems taken into account while teachers conduct classes on environment and environment related issues?

- ✓ What are the possible factors that put pressure on the practice of environmental education *about, in* and *for* the environment?

## 1.6 Significances of the Study

Given the deteriorating scale of environmental degradations and climate caused problems, particularly in the case of Ethiopia, it is important to assess what is going on in the schools regarding students' learning about their environment. In this regards, this study gives an insight about the practice of multidisciplinary integrated environmental education approach of two schools situated in different contextual and environmental settings. Besides, since it is a qualitative study, the various views, understandings and perspectives that teachers, students and school leaderships have on environmental education and environmental problems provides a valuable insight for further studies. Similarly, students, teachers, school leaderships' perceptions of their professional and individual roles towards the general problems as well as to the local environment related problems gives additional idea to understand the scenario. The study, in addition, adds its own value to fill knowledge gap in the given area.

## 1.7 Scope and Limitation of the Study

This study is limited in covering only the case of two secondary schools in Ethiopia with a qualitative research design. Thus, it may not be comprehensive enough to make generalization in a broader context of the subject of the study. It lacks the positivistic perspectives about the issue studied given the fact that the findings are entirely relied on the interpretive perspectives of the data collected through qualitative methods. Because of the obvious logistical and time constraints, it was not possible to include more schools which could have given a more comprehensive picture of the scenario. Nevertheless, due to the depth and richness of the data which were collected using different methods from various informants yet on the same subject (units of analysis), the findings of the study - in its own context - may give a glimpse of knowledge about the status of environmental education in secondary schools of Ethiopia. Patton (2002:46) describe such situations as, "While one cannot generalize from single cases or very small samples, one can learn from them – and learn a great deal, often opening up new territory for further research (...)."

## 1.8 Structure of the Thesis

The thesis is structured into six chapters. As it has been seen, the first chapter of thesis provides an introductory background of the study. The theoretical aspects of the study are presented in chapter two. Chapter three of the thesis comes up with general overview of the status of environmental education in Ethiopia. Chapter four describes detailed description of the research design and methodology including the entire processes before, during and after the data collection period. After a series of steps in the data transcription, coding (itemization) and interpretation processes, the final outcome of the entire processes are presented in chapter five. Finally, chapter six gives conclusions and possible recommendations of the findings in line with the theoretical framework and the selected literature which have been discussed in the chapters 2 and 3.

# 2 Review of Selected Literature

## 2.1 Introduction

As mentioned in the introduction chapter, the prime objective of this study is to investigate the contextual relevance of environmental education through multidisciplinary integration approach in secondary school in addressing local environmental problems. In this chapter, selected literatures which have relevance to the issue of the study are discussed.

Since discussion about education in general and teaching and learning process in particular are always linked to at least three basic elements of education and what Bernstein (1971) calls 'message systems': curriculum, pedagogy and evaluation. As defined by Bernstein (1971:9), "Curriculum defines the knowledge that is considered valid. Pedagogy defines the proper method of teaching and learning - the transmission of the curriculum. Evaluation defines objectives of the education on behalf of the pupils - the valid realization of the knowledge." Similarly, all the way through this chapter, all the discussion on environmental education is centered on the above three basic elements.

Accordingly, certain basic points on curriculum theory take the initial part of the discussion. Then, reviewing the main concepts that build up the operational definition of environmental education follows. In the remaining sections, issues related to environmental education such as, environmental education and its pedagogical arguments, why environmental education?, factors that affect the practice of environmental education and what make people act pro-environmentally - are all the issues that take the floor in this chapter.

## 2.2 Curriculum Theory

Schooling is all about playing with what is 'prescribed' and 'desired' to come in to effect by the state for which schools are entitled to operate. It is, therefore, inevitable to dwell a little on curriculum and its related stuff while one poses any question for discussion in any of the educational issues around schools.

Any theory about a curriculum bases its underlined philosophy, rationale and assumptions on the very purpose of schooling in which different questions play around, such as: what knowledge is of most worth necessary to meet the purposes?; how can this "worthwhile

knowledge" be organized and implemented so as to achieve the intended purpose of schooling and finally how to check out whether the initial goals of schooling are achieved? In this regard, one of the most celebrated scholars in the field of curriculum, Ralph W. Tyler has listed four major questions known as the *Tyler rationale* which serves as a pillar in curriculum design and development:

- ✓ What educational purpose should the school seek to attain?
- ✓ What educational experiences can be provided that are likely to attain these purposes?
- ✓ How can these educational experiences be effectively organized?
- ✓ How can we determine whether these purposes are being attained?

Among the four questions listed above, the issue debated over curriculum design and its implementation center on the question of what should be the educational objectives of schools within which the main sources from where one draws the so called educational objectives are an ever open room for debate among different school of thoughts. For instance, the *essentialists* argue that the society's accumulated knowledge over many centuries which mainly refers to the cultural heritage of the society should be used as a starting point of formulating learning objectives. Whereas, for the *progressives*, the child is the core point to decide on the objectives within which the needs and interests of a child and future anticipated problems and challenges that a child may face are basic issues to be considered while formulating objectives for a curriculum. On the other hand, the *sociologists* suggest that the main source of information in formulating curriculum objectives should come out from contemporary societal problems. And others groups like child psychologist, subject specialist and many others have their own views and arguments as to the possible source of curriculum objectives. As a result, it has been remained one of the very difficult and controversial questions in educational arena to find a common answer concerning the ultimate sources of curriculum objectives (Tyler, 1949).

For instance, for Tyler, studies of learners, studies of contemporary life and suggestions from subject specialist are possible sources of educational objectives upon which the remaining three questions in Tyler rationale build up in parallel with the initial objectives sets. However, according to Kliebard (1970), subject specialists are not a real source for educational objectives rather they are potentially responsible bodies who draw educational objectives out of the two sources. In here, the personal values and philosophical assumptions owned by these subject specialists would affect the whole process while they formulate educational objectives

and work out the remaining tasks (selection, organization and evaluations tasks of a curriculum). In related story, Tyler stated that the three sources of educational objectives need to be "filtered" through philosophical and psychological "screens." Concerning this, Kliebard (1970) again explained possible complication as to how these philosophical and psychological screens filtered out the objectives since the three basic sources of objectives subsume a wide range of issues inside. Kliedard (1970:57) stated, "The three educational objectives encapsulate several traditional doctrines in the curriculum field over which much ideological blood had been spilled in the previous several decades. The doctrines proceeded from different theoretical assumptions, and each of them had its own spokesmen, its own adherents, and its own rhetoric."

It seems, therefore, that the selection of educational objectives becomes a matter of choosing those objectives that go in consistent with the philosophical and psychological screens that the curriculum designer has owned in education (Kliebard, 1970). Thus, according to Tyler, the guiding educational philosophy is the focal and initial point to go through objective formulation and other rationales that comes following the objectives. In the preceding section, the selection and organization of learning materials and evaluation phases of curriculum design and development are discussed.

The objective set is the lasting criteria in the process of selecting and organizing learning experiences. Once we have the objectives, the next challenging task fall on: who is responsible for selecting and organizing appropriate learning experiences (teachers, curriculum designers, students, parents, who else and on what ground); what kind of learning experiences are worth being selected; and in what manner shall they be organized so as to bring the desirable behavioral change sought in the objectives. Despite the controversy as to the kind of learning experiences to include in the school curriculum, it is not also easy to go through all these tasks due to the usual gap between the rhetoric and reality, between what the so-called "learning experiences" initially sought to bring about and the final effect we get out of them. The final phase of the process is the evaluation in which the check and balance task of the curriculum is intended to be accomplished. As cited in Kliebard (1970:64) Tyler defined evaluation as "a process by which one matches initial expectations in the form of behavioral objectives with outcomes."

Having the four major guiding principles of curriculum design and development as a starting point and as an organizing framework helps the discussion that comes later in connection to theories of environmental education and the pedagogical arguments that follows.

## 2.3 Conceptual Overview of Environmental Education

> *First, all education is environmental education. By what is included or excluded we teach students that they are part of or apart from the natural world. To teach economics, for example, without reference to the laws of thermodynamics or those of ecology is to teach a fundamentally important ecological lesson: that physics and ecology have nothing to do with the economy. That just happens to be dead wrong. The same is true throughout all of the curriculum. (Orr, 1991)*

The above two combined words which appeared, linguistically, in the form of adjective –noun combination (As Manteaw (2011) call it- 'adjectival education') can yield a wide range of meanings depending on how we understand and would like to use the terms for the context we are in. It, therefore, sounds important to review the various definitions and meanings attached to concepts given by various scholars and organizations working in the area although the last choice is still left for the researcher to decide as far as this study is concerned. Thus, after a thorough discussion on what of environmental education mean from various perspectives, the final objective of this section is to provide a working or an operational definition of environmental education specific to this particular research context.

Whenever we look for the definition of environmental education, history takes us back to the first international environmental education conference, which took place in Belgrade in 1975. As an outcome of the conference, the following definition is cited in Stapp B., et al. (1975:36*):* "Environmental education should be an integral part of the educational process, aimed at practical problems of an interdisciplinary character, build a sense of values, and contribute to public well-being. Its focus should be reside mainly in the initiative of the learners and their involvement in action and guided by both the immediate and future subjects of concern."

Two years later from Belgrade Charter, similar international conference on environmental education was held in Tbilisi where the conceptual framework of environmental education was formulated as "a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and has the attitudes, motivation, knowledge, commitment and skills to work individually and collectively towards solutions of current problems and the prevention of new one" (Stapp, B., et al., 1997:36).

What is defined in the Belgrade conference is more about prescription on how environmental education should be worked out to achieve the intended goals (working on practical problems, developing important values and thereby strive for public well-being). Thus, the consideration of environmental education as a necessary part of educational process and its interdisciplinary nature are major points underlined in this first conference. Whereas, in the Tbilisi conference, as a follow up of the Belgrade charter, the concept of environmental education was described in a more specific manner like developing peoples' awareness, attitudes, knowledge, skills, and increasing the participation of the people to work collaboratively and individually for the same goal- finding solution to the contemporary environmental problems and thereby saving tomorrow a better world.

Prior to the two international conferences on environmental education, Stapp B. (1997:34) who was the first international director of environmental education in UNESCO, defined environmental education as follows: "Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work towards their solution."

When we look back on the recent definition given by UNESCO (2010:9) about climate change education for sustainable development, knowledge, skills and competences relevant to mitigation and adaptation are the core elements that the school curricula should include. "Climate change education should introduce basic scientific concepts, theories, projection of climate change. Themes such as sustainable consumption, disaster preparedness, environmental protection, recycling, water, desertification and renewable energies should be discussed, taking into account their relevance in the specific national and local context."

To sum up, the definitions of environmental education given above can be understood through the following key words and phrases: 'interdisciplinary', 'contextual', 'local based', 'knowledge', 'awareness' 'concern', 'attitude', 'problems solving skills' 'action oriented', and 'participation'. All these terms and phrases depict environmental education in terms of contents, approach and purposes – which, in later sections, refer to environmental education *about, in* and *for* the local environment. Having this, let us see a few points on the fundamental question of why do we need environmental education. A clear understanding about the very objectives and rationales of environmental education is the starting point to proceed to all possible issues surrounding environmental education.

## 2.4 Rationale behind Environmental Education

> *Human beings are very good at perceiving drastic and sudden changes but are often unable to perceive slow, incremental changes. We are, in many respects, like the frogs in the famous experiment: when placed into the hot water, they immediately jumped out but when put into cool water that was slowly heated, they did not react and boiled to death.* (Kollmuss & Ageman, 2010:253)

In the previous discussion on curriculum, it has been pointed out that educational objectives are the major stepping stones that dictate the remaining educational tasks ahead. Similarly, a clear understanding of the underlined rationale and assumptions and core objectives of environmental education lay the ground for the major tasks of environmental education (designing curriculum, choosing appropriate pedagogical alternative and deciding appropriate mode of evaluation).

Nature is an irreplaceable alternative for the survival of all human and non-human creatures and there is always inevitable interdependence between human being, non-human beings and nature in all forms of life. This reality is the very initial rationale behind environmental education. Stapp B, et al. (1997:34) stated, "The principal feature of the philosophy of environmental education is that man is an integral part of a system from which he cannot be separated. Specifically this system consists of three components, man, culture and the biophysical environment." This statement is now what other scholars said it 'bio-centric view point' or biophysical education (Misiaszek, 2010; Sebly, 2000) which is linked to concept of what Selby (2000) call it 'relational holism.' Selby (2000:90) described bio-centric education as, "Whole school and school in community learning and celebratory experiences reaffirming the embeddedness of human life, culture, and society within nature. Students would learn how our humanity draws succor from the earth and is diminished as we diminish the earth."

The notion of bio-centric education, in other words, tells the relational pattern between human being and natural resources in which the existence of man is completely dependent on the existence of natural resources and any human made civilization and quality of life or whatever else important to the needs of human creature are heavily relayed on the use of resources. In the same way, the manner in which human acts and use resources determine the continuity of healthy biophysical environment. In Stepp's statement about philosophy of environmental education, man is categorized as part a system that interacts with culture and biophysical environment. Stepp, et al., (1997:34) defines culture as "organizational strategies, technological processes, and social arrangements (political, legal, managerial, educational,

etc.) through which man interacts with the biophysical environment." Within this interaction, human beings have the power to do the hell of devastation or to cultivate, conserve and thereby maintain healthy interplay between elements in the whole process of a system.

Here is the fundamental role that education can play for desirable behavioral change by acquainting all men and women with basic knowledge of the biophysical environment, relevant skills about its manipulation and positive attitude towards it (Stepp, et al., 1997; Kollmuss & Agyeman, 2002).

When we talk about the use and manipulation of natural resources, it seems wise to consider all boys and girls at schools who are potential 'green consumers' of today and the future - who can change and influence their own family purchasing trends. Green consumer - as defined by Strong (1998:349) - refer to "one who avoids products that are likely to endanger the health of consumer, cause significant damage to the environment during manufacturing, use or disposal; use materials from derived from threatened species or environments, etc." In addition, students are also future politicians, scientists, environmentalists, decisions makers, policy makers, curriculum developers, educators, engineers, parents, etc. On the other hand, students are future vulnerable groups that could possibly be affected by consequences of environmental degradations, catastrophes, over population and to various and several forms of climate caused problems.

Accordingly, Stepp, et al., (1997:35-36) has formulated the following core objectives that environmental education need to help people to have:

- ✓ *A clear understanding that man is inseparable part of a system, consisting of man, culture, and the biophysical environment, and that man has the ability to alter the interrelationship of this system*
- ✓ *A broad understanding of the biophysical environment, both natural and man-made and its role in contemporary society*
- ✓ *A fundamental understanding of the biophysical environmental problems confronting man. How these problems can be solved, and the responsibility of citizens and government to work towards their solution*
- ✓ *Attitude of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem solving.*

Then the final question is how education can achieve these fascinating objectives.

With this in mind, let us turn to the possible and practical meaning of environmental education in the teaching and learning processes. How do we deal with it in schools, what

possible practical implication can all the above discussed environmental education objectives and definitions have inside the school compound? The preceding section deals with these questions.

## 2.5 Approaches to Environmental Education: Environmental Education *about, in* and *for* the Environment

The semantics attached to education and environment while connected by those prepositions listed above reveal different meanings and interpretations, which could possibly refer to educational objectives or goals, teaching methodology, sources of learning experiences (educational input or contents) and learning process.

Education *about* the environment refers to the knowledge aspect of environmental education which simply means the teaching of basic scientific facts, 'concepts' and problems connected to the biophysical environment. Education *in* the environment represents the possible methodological alternative as to how the teaching and learning process should proceed. In this context, the bio-physical environment could potentially be used as a 'medium of instruction' for environmental teaching and learning process. Education *from* the environment implies the use of the local environment as a source of learning experience, facts, and concepts attached to the environmental education (education inputs). Finally, education *for* the environment simply refers to what we call *environmental education*. *For* represents the prime purpose of education in connection with environment (Scott & Oulton, 1999; Walker, 1997; Palmer & Neal, 1994; Strong, 1998).

Walker (1997:159) stated, 'it is '*for* the environment', or the action component which both differentiates environmental education from other curriculum areas and also requires practitioners to revise their theories of teaching and learning.' Education *for* the environment, according to Scott & Outlon (1999), can have three forms of knowledge: *Technical, practical* and *anticipatory* which represents education *about, in* and *for* the environment respectively. It has been also further categorized that education *about* the environment is associated with the positivism, education *in* the environment linked to interpretivism and finally education *for* the environment is associated with critical approach in research (Scott & Outlon, 1999).

When environmental education is seen in a teaching and learning process, there are three interrelated elements - education *about, in* and *for* the environment- which are meant to serve the whole purpose of environmental education (knowledge and understanding, skill, attitude and behavior). Palmer & Neal (1994:38) suggested the following as to how environmental education framework is designed:

> *It expands upon the threefold framework which underpins planning: tasks should be planned that educate 'about' the environment, 'for' the environment, and that are accomplished 'in' the environment. Within this framework, we identify the three crucial elements of personal experience 'in' the environment, the development of personal concern 'for' the environment, and the taking of personal action in and on behalf of the environment.*

Thus, the underlined notion and meaning attached to the three interrelated concepts (Education *about, in* and *for* environment) subsumes what needs to be taught, how it is to be taught and for what effect it is intended to be taught; and it can be used as typical environmental teaching and learning model (Palmer & Neal, 1994).

## 2.6 The Pedagogies of Environmental Education

> *The way learning occurs is as important as the content of particular courses. Process is important for learning. Courses taught as lecture courses tend to induce passivity. Indoor classes create the illusion that learning only occurs inside four walls isolated from what students call without apparent irony the "real world." Dissecting frogs in biology classes teaches lessons about nature that no one would verbally profess. (Orr, 1991:52)*

Whenever we put the issue of environmental education on the table, its pedagogical aspect comes at the forefront of the discussion. As highlighted earlier, environmental education within the lens of curriculum theory and principle (*the three message system*), has mainly three dimensions: environmental education in terms of subject matter (contents of lessons) to be taught, of teaching methodology and mode of evaluation. Although there is not a single clear-cut answer as to how schools have to work on the given three dimensions, various alternatives have been forwarded about how schools need to work in connection with environmental education.

According to Gruenewald (2003:3), the term environmental education seems very associated with 'place based education,' 'outdoor education', 'ecological literacy,' 'education as an integrating context,' 'global education,' 'nature education,' 'sustainability,' 'critical pedagogy', 'critical pedagogy of place', etc. It seems different naming but share very similar ground when it comes to the final outcomes that each seeks to attain. The following section is

a brief discussion on some of the widely heard pedagogical alternatives of environmental education.

## 2.7 Place-based Education

The meaning attached to the term '*place*' is the focal point of *place-based education* in particular and to the whole notion of environmental education in general. *'Place'* refers to one of the major aspects whenever one deals with the relevance of education in context. It seems within this assumption that *place-based education* is considered as one possible option for environment oriented education. Proponents of *place-based education* - Woodhouse, et al. (2000:3) – believed that "education should prepare people to live and work to sustain the cultural and ecological integrity of places they inhabit. To do this, people must have knowledge of ecological patterns, systems of causations, and the long-term effects of human actions on those patterns." Woodhouse et al further describe the connection between *place-based education*, *outdoor education* and *environmental education* since the starting point for all of them is the biophysical environment of the local place, the community and the overall context in which learners belong to. Similarly, Community oriented schooling, bioregional education and ecological education are all different names, but referring to similar notion hold in *place-based education.*

It is the value of direct (first- hand experiences) experience with the authentic environment; and the significances attached to the historical, scientific and aesthetic values of a place that underpinned the very assumption behind *place-based education* through which it is meant to achieve the social, cultural and environmental sustainability of local communities. Accordingly, Woodhouse et al, (2003:3-4) listed the following major features of *place-based education*:

- ✓ *It emerges from a particular attributes of a place.*
- ✓ *the content is specific to the geography, ecology, sociology, politics, and other dynamics of that place,*
- ✓ *It is inherently multidisciplinary, experiential and its goal goes beyond "learn to earn,"*
- ✓ *Place is the tread which connected to self and community, etc.*

Sobel (2004) defined that *place-based education* is an approach of teaching '*concepts*' in different school subjects (e.g., language, mathematics, science, social studies, etc) by using the local community and the biophysical environment around as teaching resource in order to

give learners 'hand-on', 'real world experiences'. This approach believed to have a positive impact on learners' academic achievements in addition to strengthening learners' relationship with the community, environment or nature.

*Place-based education* is an approach to education which facilitates learners' active participation and engagement in different aspects of their community including the social, cultural and environmental issues and problems of the local community through various school subjects.

## 2.8 Critical Pedagogy of Place

As described in Gruenewald (2003), critical pedagogy of place is a newly blended educational trend from 'place-based education' and 'critical pedagogy'. Gruenewald (2003:1) justifies the rationale of combining the two educational traditions into a single approach that satisfy the major objectives sought in both traditions as:

> *Place based pedagogies are needed so that the education of citizens might have some direct bearing on the well-being of the social and ecological places of people actually inhabit. Critical pedagogies are needed to challenge the assumptions, practices, and outcomes taken for granted in dominant culture and in conventional education.*

On the bases of this assumption, Gruenewald comes up with two defining objectives of critical pedagogy of place: '*reinhabitation*' *(*'Learning to live-in-place in an area that has been disrupted and injured through past exploitati*on*') and '*decolinization*,'*(*'learning to recognize the disruption and injury and to address their causes*'*) and both goals are highly interlinked with place-based education and critical pedagogy respectively. Thus, as cited in Manteaw (2011:34), Gruenewald (2003) defined critical pedagogy of place as follows:

> *Critical pedagogy of place posits two fundamental goals for education: decolnization and reinhabitation. In decolonization, learners go through self-critical epistemological processes to gain personal awareness and understanding of local situations. This awareness and understanding of the local problems and their underlying causes result in a new desire and a new sense of empowerment to re-inhabit to live well in their places by exploring emancipator possibilities.*

In short, the prime purposes of environmental education are, engaging learners with critical enquiry about the causes of local environmental problems, improving learners' understanding and knowledge about their local biophysical environment, helping them to develop certain appropriate skills, and thereby motivate them to take positive action that could enhance the ecological situation of their place.

The core points raised in connection with place based education and critical pedagogy of place and in the entire discussions on environmental education underline the decisive role of 'place' wherein learners inhabited. This takes us to *place attachment theory* which is of relevance to environmental education teaching and learning process when one is concerned about the contextual relevance of education.

## 2.9 Place Attachment Theory

> *'Place is not just a thing in the world (…) place is also a way of seeing, knowing and understanding the world.'* Croswell (2003) as cited in Devine-Wright *(2012)*

Recently, researches on place attachment theory have been given an increasing attention in various disciplines such as human geography, architecture, sociology and environmental psychology (Hidalgo & Hernandez, 2001; Devine-Wright, 2012). The study of people-place relation has a wide range of implications particularly in environmental protection and conservation and climate change mitigation and adaptation by way of studying the values, attitudes and concerns individuals and group have towards their place. For instance, the concept of 'NIMBY' (Not In My Back Yard) – which refers to a 'public opposition to new developments near homes and communities' (Devine-Wright, 2009:426) – is an action meant to protect the local place. This has a positive implications and it can also be instrumentalized to foster positive environmental action to protect and conserve the local biophysical and social environment by the local people.

Place attachment is defined as 'the affective relation or the emotional bond that people have with places where they live' (Bonaiuto, Carrus, Martorella & Bonnes, 2002).Various studies confirmed that peoples have a positive affective and behavioral bond with the physical and social environment they were born, grew-up and dwelled for certain period of time (Jorgensen & Stedman, 2001; Hidalgo & Hernandez, 2001). This attachment bond is manifested and strongly associated with people's actions and participation in community duties and pro-environmental behaviours (Devine-Wright, 2009, 2012).

Place attachment theory is a theory connected to 'place identity', 'self-identity', 'sense of community' and 'sense of place' which is thought to have a greater value and implication for environmental education. This is mainly because; studies confirmed that there is a positive correlation between sense of place and environmentally responsible behaviour. As cited in

Gruenewald (2003), Orr (1992) suggested that the study of place is important to teach people to let them live in a place they are inhabited.

Similarly, Yohannnes (2007:40) described how people-place relation and emotional bond have an impact on certain interventions like resettlement. “Ethiopians educated or otherwise, have intimate attachment to their places of birth and the places they are brought up. Resettlement is often considered to be one of the devil’s alternatives to drought-induced famine and death.” The point here is to recognize the potential power that peoples’ sense of place and attachment to the social and physical environment can play a positive role for the development of desirable behavior and to consider the implication of this to environmental education.

## 2.10 Determining Factors in the Practice of Environmental Education

### 2.10.1 School Curriculum

The manner in which environmental education is considered and placed in school curricula is critically important to create an enabling teaching and learning condition that foster school community engagement in local environmental issues. However, the commonly used trends show only the inclusion of some environment related themes or topics in the form of class room lessons across various school subjects. Bangay & Blum (2010:7) describe the status of environmental education in school curricula and educational trainings as: “In many cases, it is seen as an alternative education which has little value to main stream educational development goals, and is therefore widely addressed through ‘add-on’ of environmental topics in curricula and training programs.” Simple addition of environment related input into the ongoing school curricula may not be sufficient to bring about meaningful pro-environmental behavior among learners - which is the ultimate goal of environmental education (Rickinson, 2001). This is partly because, what is sought as far as environmental education is concerned is that learning has to be ‘transformative.’ Learners have to go away from the dogmatic way of thinking, behaving, acting, and there has to come time to stop working on our key systems such as schooling with the mentality of business as usual (Bangay & Blum, 2010).

### 2.10.2 Teachers' Perception of Curriculum and Pedagogical Ideologies

Teachers, as central in the whole process of teaching and learning, have always a role to play for the fulfillments of the desired goals of schooling. On the contrary, one of the most commonly treats for implementation whenever changes are made in a curriculum, pedagogical approaches and system of assessment is teachers' resistance to changes. This is simply because teachers have their own views, philosophies and ideologies about curriculum, pedagogy and assessment and as a result it is very likely that practical application of innovative pedagogies fall short to reach their outcomes. Walker (1997:160) stated, "There is often a difference, or gap, between the theories held by policy makers, curriculum developers and educational researchers and the theories held by practitioners." Similarly, Stevensen (2007:150) noted that "beside the organizational pressures, teachers' views about knowledge and teaching (their epistemological and pedagogical beliefs) are likely to influence what form of knowledge is selected and how that knowledge is then organized and transmitted in the classroom."

Thus, the practicality and effectiveness of environmental education are partly determined by the two epistemological views that knowledge is objective, discrete, empirically tested and on the contrary, knowledge is subjective, socially constructed through learners' active engagement to solve certain problems. Thus which of which epistemological views are considered worth by teachers determines the whole process of teaching and learning. For instance, if teachers, students and the community at large held the earlier views about knowledge and the purpose of schooling, then environmental education may contribute to formation of discrete information and knowledge concerning the environment.

### 2.10.3 Standardization

One of the challenges of education that hinders its ecological contributions to the local community is probably misplaced expectations, standards, values of schooling from which all the school community desire to achieve through education, that is credentialing and standardization roles. Stevenson (2007:145) describes the possible impact of the widely held purpose of schooling: "One of the dominant beliefs is that the role of schools should include credentialing students with respect to their ability to demonstrate mastery of 'valued'

knowledge and skills. Students' performance then becomes a significant determinant of their life chances and economic well-being."

In many cases, due to an influence exerted from centralized and standardized curriculum, very little space is left for schools to make a proper link between students and the surrounding community and engage them to interact with the real environment where they live. Sobel (2004:5) criticizes the negative impact of standardization as, "Educational biodiversity falls prey to the bulldozers of standardization. Schools hover like alien spacecraft, luring children away from their home communities. More and more, we drive a wedge between our children and the tangible beauty of the real world."

### 2.10.4 Purpose of Schooling

> *Why do we go to school, why do we learn various subjects, why do we pass examinations and compete with each other for better grades? What does this so-called education mean, and what is it all about? This is really a very important question, not only for the students, but also for the parents, for the teachers, and for everyone who loves this earth. Why do we go through the struggle to be educated? Is it merely in order to pass some examinations and get a job? Krishamurti (1989)*

This is the very question that determines the selection of educational inputs, the means to achieve educational goals and the final outcomes sought by all members of school community - parents, teachers and students. The reality of environmental education again falls in the purpose of schooling whether it is part of the mission or not. In connection with this idea, Orr (1991:52) adapted the following idea from the Greek concept called 'paideia' and stated,

> *The goal of education is not mastery of subject matter, but of one's person. Subject matter is simply the tool. Much as one would use a hammer and chisel to carve a block of marble, one uses ideas and knowledge to forge one's own personhood. For the most part we labor under a confusion of ends and means, thinking that the goal of education is to stuff all kinds of facts, techniques, methods, and information into the student's mind, regardless of how and with what effect it will be used.*

## 2.11 What Make People Act Pro-environmentally?

What are the prerequisites to people's pro-environmental actions? Knowledge *about* environment, environment related skills, positive attitude towards environment, prior environment related experiences, what else is/are needed? What do we need to do to help learners develop desirable environmental behavior? It is beyond the scope of this paper to answer these questions for the question itself is 'a work in progress' in environmental

education researches (Kollmuss & Agyeman, 2002). However, there are various assumptions as to how education helps learners to develop pro-environmental behavior which is a prerequisite for environmental friendly actions. Kollmuss & Agyeman (2002:240) defined pro-environmental behavior as, "behavior that consciously seeks to minimize resources and energy consumptions, use of non-toxic substances, and reduce waste production." The next sections discussed about some of widely used framework as to how one develops pro-environmental behavior which is thought to be the final goal of environmental education.

Kollmuss & Agyman (2002) discussed three of widely used framework namely: US linear progression model, altruism, empathy and pro-social behavior model and sociological model. Furthermore, there are factors that have either positive or negative impacts on the development of pro-environmental behavior. Some of these factors are 'demographic factors,' 'external factors' (e.g. institutional, economic, social and cultural) and 'internal factors' (e.g. pro-environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities and priorities) ( Kollmuss & Agyman, 2002).

### 2.11.1 Early US Linear Models

The very assumption in Early US Linear Models is that environmental knowledge is an important initial step which is believed to lead learners to be aware of and concerned (attitude) about the environment. As a result of the new environmental concern (attitude), one develops pro-environmental behavior (the ultimate goal of environmental education). According to Kollmuss & Agyman (2002), the pattern of Early US Linear Models is presented in figure 2.1.

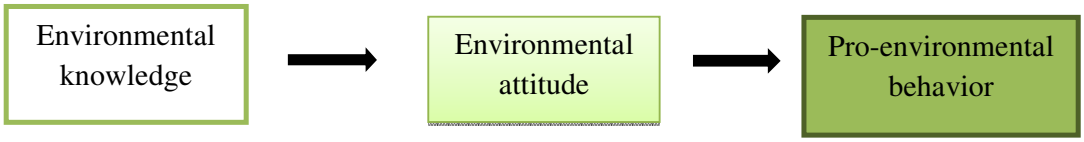



**Figure 2.1** Early US linear Model

Although the given model underlined the significant role of environmental knowledge in the process of attitude formation and behavior development, there are arguments that knowledge alone does a little to help people to develop the desired kind of behavior sought through environmental education. One of the justifications raised is the gap between attitude and behavior which, according to Kollmuss & Agyman (2002), is linked to the extent of impact

that direct and indirect learning experiences can have on learners' behavior. Direct experiences with in the biophysical environment has relatively stronger impact on learners' behavior while indirect learning experience, which is learning about environment, has little role in shaping people behavior.

On top of this, the influence of 'social norms', 'cultural traditions', 'family customs' and the 'social value system' in which students grew up weaken the power of education to shape learners' attitude in a way that is desired - which again results a wider gap between attitude and behavior (Kollmuss & Agyman, 2002).

Studies confirmed that there are factors which contribute positively to the development of responsible pro-environmental behavior. These are knowledge of the issues, knowledge of action strategies (skills), locus of control (internal -which mean to believe that one's own action can bring change and external- to believe that one's own action is less significant to bring change), attitudes, verbal commitment, individual sense of responsibilities.

### 2.11.2 Altruism, Empathy, and Pro-social Behaviour Models

Altruism is "a subset of pro-social behavior" and it has been hypothesized that people who are strongly selfish and with competitive orientation and people whose needs are not satisfied are very likely to lack the commitment to act responsibly towards their environment (Kollmuss & Agyman, 2002).

Alturism orientation model includes 'social orientation', 'egoistic orientation' and 'biospheric orientation.' Kollmuss & Agyman (2002) explains this model as, "The social orientation is concerned with the removal of suffering of other people, the egoistic orientation is concerned with the removal of suffering and harm from oneself, and the biospheric orientation is concerned with the removal of destruction and suffering in the non-human world."

Thus, in order for a person to act pro- environmentally, she/he has to look at things beyond her/his personal interests and be able to feel responsible to the community. However, one can behave in a manner that favor the community only if the person has achieved good self-esteem, sense of belonging to a community, has a strong self-efficacy and has developed positive thinking. (Kollmuss & Agyman, 2002).

### 2.11.3 Sociological Model of Pro-environmental Behaviour

Here again there are list of variables that leads to pro-environmental behavior, some of the variable have direct influence while other have indirect role to enable learners develop pro-environmental behaviour. In figure 2.2 the model taken from Fietkau & Kessel (1981) as cited in Kollmuss & Agyman (2002:246) is presented.

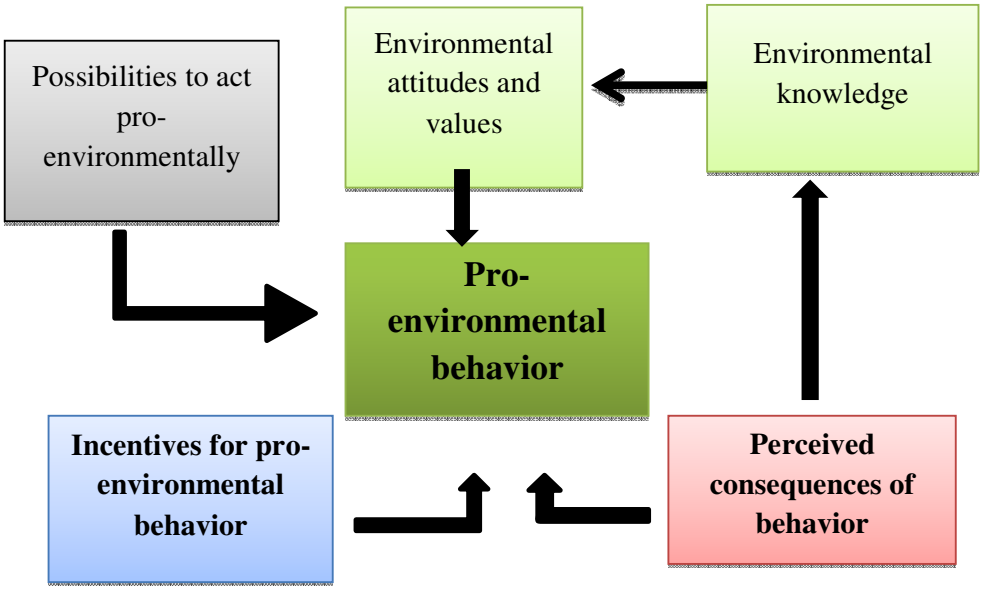



**Figure 2.2** Model of Ecological behavior (taken from Fietkau & Kessel, 1981)

The above three models are just instances about how people possibly develop pro-environmental behavior given various barriers that intervene within the process of behavior formation.

In this chapter, some selected issues, concepts and theories that are interlinked with environmental education are discussed. It has been pointed out that environmental education is an interdisciplinary approach to education which is built upon three interrelated concepts (education *about*, *in* and *for* environment). Through this approach, education facilitates learners to have knowledge and understanding about issues and concepts of their local environment; develop relevant skills, positive attitude and concern for the environment. And this helps students develop pro-environmental behavior - which is believed to be a necessary condition for people to take actions to conserve, protect and enhance their local biophysical environment.

In the preceding chapter, the status of environmental education in the case of the Ethiopian education context is discussed in order to provide an overview about the whole scenario of the given issue to which this study is catered for.

# 3 Environmental Education in Ethiopia

## 3.1 Education in Ethiopia

Secular education was introduced in Ethiopia in the beginning of the 20th century. Prior to this period, church education, which was entirely religious education had been the sole and dominant type of education for more than 1500 years in the country. Since the 4th century - the first period that Ethiopia accepted Christianity - Ethiopian Orthodox Church had developed an education system that provides cultural, spiritual, artistic (particularly music, painting, and other genres) education. Such church-led education had been training young men for deacons, priests, biblical experts, judges, administrators, various public servants, etc. However, its coverage was limited in the northern and northeastern part of the country and access was only open for certain selected group the population (particularly men) who are from dominant ruling society and elite families (landlords, regional leaders, clergymen). After a long sustained resistance by the Ethiopian Orthodox Church, the first modern school was opened in 1908 in the present capital city Addis Ababa. Because of its late introduction in the history of Ethiopian education, the expansion of secular education had been very slow for various reasons like the Italian invasion, long lasting civil war, cultural and economic reasons, etc and until 1974 the rate of illiteracy in the country was more than 90 percent.

In the last decade and a half, the rate of expansion of secular education in the country is astonishing in its own historical context though it is still the least developed (40% literacy rate) as compared to the rest of the world including sub-Saharan average (UNICEF, 2010). The enrollment rate from primary education until higher education is very high. For instance, in 2009/10 the primary education enrollment reached over 86 % which can be considered very high as compared to 50% in 1990 (UNDP, 2011). Generally, in 2010/11, the total annual enrollment reached over 20 million students from which 1 054 048 students are enrolled in pre-primary school, 16 372 821 are in primary school, 1 738 469 of them are attending secondary school, and the remaining 459 446 and 534 633 students are perusing the TVET[1] and higher education respectively (MOE, 2011). Despite the encouraging rate of expansion

[1] **TVET**: represents Technical and Vocational Education and Training- it is post first cycle general secondary school program which is designed for students who are unable to qualify for the admission of the preparatory school (pre-college education)

and coverage, the country's education system is still entangled with lack of quality, access, relevance, large class size, high teacher-student ratio, shortage of learning materials and lack of qualified teachers (MOE, 2010). Figure 3.1 shows the structure of Ethiopian Education System including teachers' qualifications and requirements.

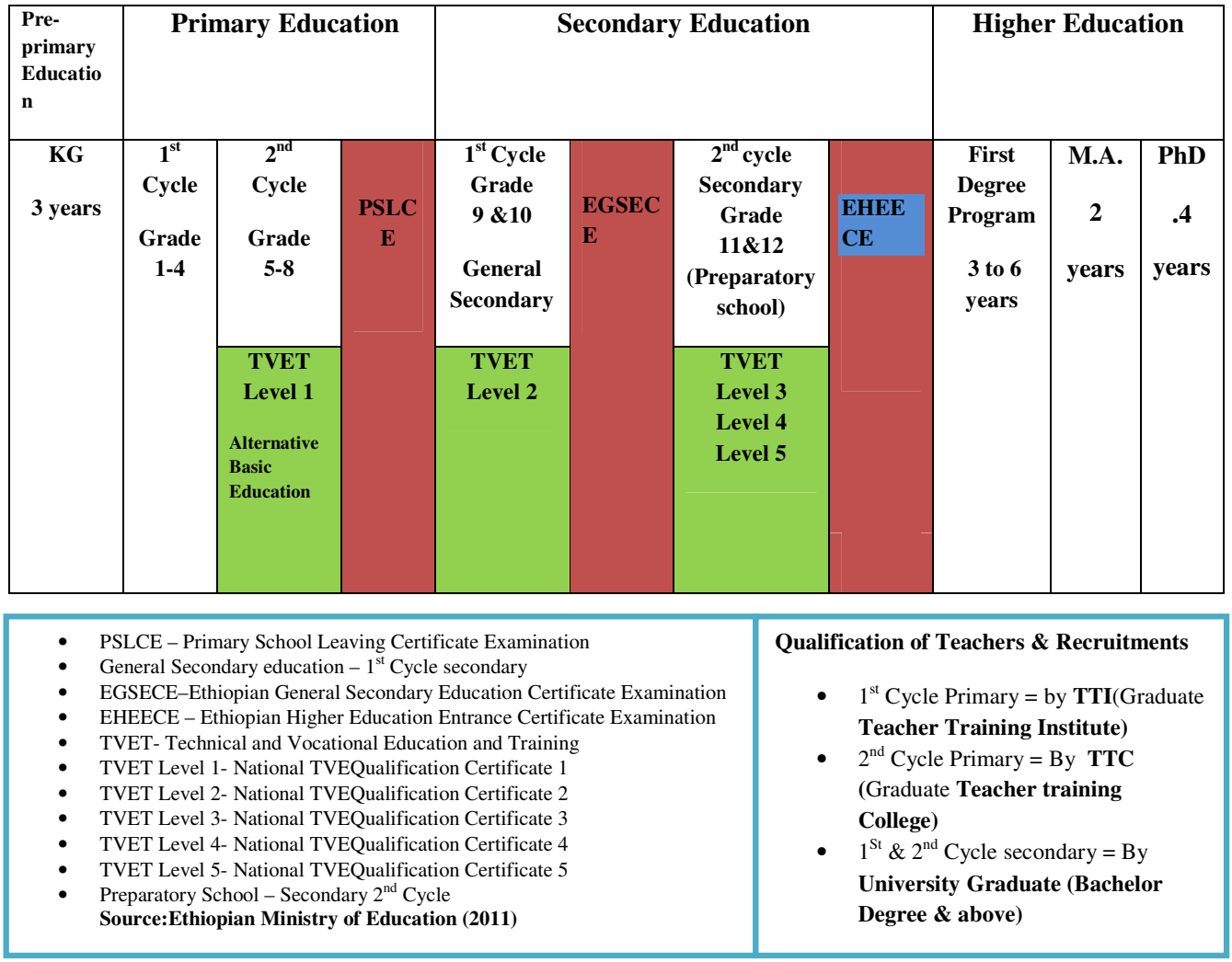



**Figure 3.1.** The Structure of Ethiopian Education System

As it can be partly inferred from figure 3.1, the structure of formal general education in Ethiopia can be divided in to the following categories: kindergarten, general, technical-vocational and higher education. Apart from the first three years of pre-primary education, primary school education has eight years of schooling with two phases - First cycle (grade 1-4) and second cycle (grade 5-8) primary education. Secondary school education has four years of schooling (grade 9-12) from which grade 9 and10 are general secondary school educations and the remaining two years are senior secondary schooling - which are designed to prepare

students for higher institution education. Technical and vocational education and training (TVET) is another alternative post-general secondary school education which is established to train students who are not able to score the minimum entrance grade in the 10th grade national examination - which is a must requirement for senior secondary school education admission (MOE, 2011).

## 3.2 Environmental Education in Ethiopia

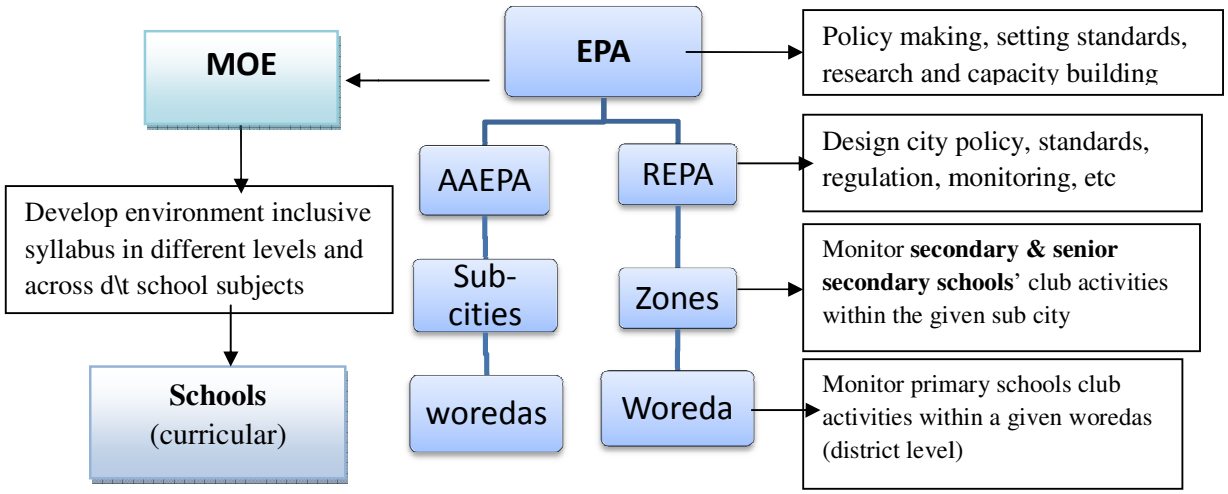
> *Schools, as institutions for general education, are believed to have a responsibility to equip their students with the knowledge and commitment to take personally meaningful decisions and action to address the challenged posed by both lifestyle and societal conditions. Achieving this goal requires, among other things, adequate integration of the challenges.* (Dalelo, 2012:619)

In following section, a brief introductory review is made on certain issues about the status of environmental education in Ethiopia. In that, the place of environmental education in the country's education and training policy document is highlighted first. Then, the type of curriculum development approach which is used to integrate environmental education into the ongoing school curricula takes the turn for discussion until the final reviews about the practice of environmental education in Ethiopia comes in. Thus, some of the basics about environmental education in Ethiopia in the light of education policy, curriculum development and teaching practice are the core issues discussed below.

Since the past two decades, as a consequence of the government change in Ethiopia and a new global shift in climate change and concern for environmental degradations, the issue of environment has taken the centre stage in many of the national and international development dialogues and policy agendas (Dalelo, 2012). An increasing interest in strengthening the connection between education and environment 'better' than previous periods is part of such developments. Accordingly, education has been given a great deal of instrumental role in various environment protection and conservation policy implementation strategies in Ethiopia (ESDP IV, 2010). One of the typical instances for such premise is the emphasis given to environmental education that is seen all the way through the list of specific and general objectives of the country's education and training policy document - which was developed in 1994 (FDRE, 1994). The 1994 Education and Training Policy of Ethiopia, which is still the existing education policy of the country, describes objectives of education as "(…) education that can produce citizens who possess national and international outlook on the environment,

protect natural resources and historical heritages of the country. Bring up citizens who can take care of and utilize resources wisely."

Similarly, Ethiopian Environment Protection Authority (EPA) formulated a new environment policy in 2002 within which 'environmental education and awareness policy' was one of the cross-sectoral strategic policies. In that particular section, due emphasis is given in promoting the integration of multi-disciplinary environmental education across various school subjects at all levels of schooling (EPA, 2002). In addition to promoting the integration of multi-disciplinary environmental education in school curricula, EPA developed an inspection and monitoring framework within which various layers of offices work at various levels to monitor and inspect different environmentally connected activities that are going on the school level (particularly environment club activity), institution level as well as city level. These offices are structured from the top federal EPA office until the lower *woreda* (district) level. Besides, EPA also works in collaboration with the MOE in order to make environmental issues to be prioritized in the curriculum development process. Figure 3.2 gives an overview of the top-down structure of EPA's offices at various levels:




**EPA**: Environment protection Authority,
**AAEPA**: Addis Ababa Environment protection Authority
**REPA**: Regional Environment protection Authorities,
**MOE**: Ministry of Education

**Figure 3.2**. The hierarchical structure of governmental EPA offices from the top Federal office through the smaller unit of Woreda (district)

Consequently, environment related contents are integrated within the curricula across all levels of schooling from primary through higher education. In some cases, like the case of primary school, a separate subject named '*environmental science'* has been in effect at first cycle primary school (grade1-4). Whereas, at the second cycle of primary school and in the first and second cycle of secondary schools, environmental contents are incorporated in different school subjects through 'infusion approach', mainly in biology, geography, chemistry and language subjects (Hailu, 2007). For instance, in 10$^{th}$ grade biology and geography students' textbooks, there are more than three units in each case with contents related to biophysical environment and social environments from the total 5 and 6 units respectively. If we take a glance again in the same grade English textbook, seven units out of 13 units are about environment related issues having a mix of national and global environment topics.

As noted above, the importance of integrating environmental education across all levels of school curricula is well-evidenced in Ethiopian education policy document as well as in the existing students' textbooks and teachers' guides. Then, the follow-up question is how the actual teaching and learning practice treats the three core elements of environmental education - teaching *about, in* and *for* the environment. As discussed in the theory chapter, these basic interrelated aspects of environmental education represent knowledge, attitude, and behavior which are argued to be achieved by teaching students about the basics of environment through meaningful interaction and direct contact and experience with the real environment. This, in the process, helps students to develop a habit and action competence which enable them to protect and conserve their local environment. In the preceding section, some empirical studies are reviewed in relation to the status of environmental education in the context of primary, secondary and higher education in Ethiopia.

## 3.3 Literatures on Environmental Education in Ethiopia

Abishu (2002) made as assessment of to what extent of environmental contents integration and the manner in which environmental elements are infused in primary school curricula particularly in grade five and six classes in a region called Oromia[2]. The study was conducted using content analysis technique on science and social study textbooks and various quantitative and qualitative methods (questionnaire, focus group discussion and checklist). As

[2] Oromia: is biggest regional state among nine regions in Ethiopia.

a result, Abishu (2002) found out that environmental contents such as, vegetation, land, wildlife, air, the interaction between man with natural environment are some of the most frequently integrated topics in grade five and six science and social study textbooks – but to lesser degree in social study subject. Furthermore, the study in addition, showed that the mode of evaluation and teaching and learning activities lack practical activities and direct contact with the natural environment. According to Abishu (2002), only 4.2 % of the exams tend to evaluate the practical skills of students, the remaining 95.8 % of evaluations are based on paper and pencil tests. Moreover, Abishu (2002) argued that both science and social study textbooks present very little room to deal with immediate local and regional (Oromia) environmental problems rather many of the environment related contents presented are more about national and global problems.

In a similar study, Hailu (2007) conducted an investigation on the status of environmental education and environmental awareness in Addis Ababa metropolis schools. Accordingly, he tried to assess the students' level of environmental awareness, effectiveness of environmental education and the impact of parents' educational status, the types of school, gender and grade level. The study covered twenty schools in Addis Ababa. The researcher employed content analysis on biology and geography textbooks from grade nine and ten and questionnaire for students to gather data. The final data revealed that students' family income, students' grade level and age are found to determine students' level of environmental concern. More importantly, the study showed that environmental teaching is only limited in chalk and board teaching process without involving students in any kind of field activities that connect the classroom lessons with the real biophysical and social environment. However, students' level of concern and awareness about environmental problems is found to be high. Hailu (2007), in his study, underlined the importance of creating the opportunity for students to participate in various environment related in and out of school activities to enable them contribute to solve environmental problems.

Upper primary school (grade 5-8) teachers' awareness, attitude and practice of environmental education are the other environmental education areas which were studied by Gebre (2010). Gebre (2010) tried to assess teachers' level of awareness on environmental issues, their attitude towards the environment and how they carried out their daily teaching duties in connection to environmental lessons. In addition, he also analysed the environmental content integration in upper primary school textbooks. The researcher used qualitative textbook

analysis and quantitative questionnaire to collect data on the given issues. Accordingly, the result showed that a considerable amount of environmental issues are incorporated in Civic and Ethical Education textbooks and many of environment-related problems typical to the case of Ethiopia are presented in English textbooks. Besides, Gebre (2010) also found that teachers have a positive attitude towards environment although the level of their awareness is low and their environmental teaching practice is limited to the classroom activities - with very little extracurricular and out of school activities. Finally, Geber (2010) emphasised that teachers' pre-service training fall short to adequately address the importance of environmental education. Personal reading and media are mentioned as main source for teachers' environmental awareness, knowledge and favourable attitude towards the environment.

Now let us turn to studies which were conducted on various aspects of environmental education in higher institutions in Ethiopia. In this regards, I take a study by Johannes (2007) as sample instance which assessed the level of environmental literacy among senior students of four agricultural colleges in Ethiopia. Johannes (2007) prepared a questionnaire which contained 105 questions with a particular focus on environmental literacy- knowledge, attitude and behaviour. The questionnaires were given to 350 senior students in Haromaya University, Debub University, Jimma University and Mekele University. Thus, on the bases of the students' responses, Johannes (2007) concluded that students' level of environmental knowledge, their ability to define key environmental concepts, their understanding of the national and international environmental issues are fairly high. In addition, he also confirmed that students have shown a positive attitude towards the environment. Moreover, Johannes (2007) indicated that many of the participant students in the study showed 'environment-friendly habits and hobbies' which can be taken as a positive step given their future professional contributions related to the environment - since all of them are prospective graduates from agricultural colleges.

In similar ways, Belaynesh (2010) studied Addis Ababa University second and fourth year students' awareness and attitude towards rural land degradation in Ethiopia. The level of awareness, the relationship between awareness and attitude, the difference between students of different year, age, field of study and gender on those dependent variables are the major focuses of the study. Accordingly, Belaynesh (2010) chose 289 sample students from three faculties and she conducted awareness and attitude assessment using multiple choice awareness test and Likert model of attitude scale. The result was computed using descriptive

statistics, t-test, Pearson correlation coefficient and ANOVA. Thus, students showed 'moderate' level of awareness and favourable attitude towards rural land degradation in Ethiopia. However, statistically significant difference was observed in the level of awareness between male and female, younger and older, social science background students and natural science student and rural and urban background students. Those students who are older and males showed higher levels of awareness on issues related to the problems, causes, consequences and solutions of land degradation and deforestation than others. Similarly, students with rural background showed better level of awareness on land and forests than students with urban background. Nevertheless, there was an insignificant difference of attitude towards land degradation and deforestation among students of different age, gender, faculty, rural-urban background and college years. Finally, the correlation coefficient showed statistically significant positive correlation between environmental attitude and awareness though it is weak.

## 3.4 Concluding Remark

In this chapter I have presented a review of certain studies conducted in connection to environmental education in the context of Ethiopia at various levels with diverse focus areas. Some of the studies were about the level of environmental awareness, knowledge, attitude and behaviour of students and teachers of different levels in the education system. A few others did research on environmental content integration across various school textbooks and the practices in the actual teaching and learning processes. But, many of the studies I reviewed are quantitative and some are mixed type which lack qualitative point of view behind the problems detected with regards to environmental education in Ethiopia.

Generally, environmental education is one of the least studied areas in the context of Ethiopia despite the fact that the country is one of the victim countries that suffered the most due to the direct and indirect consequences of environment related problems (Damtew, 2008). Many of the studies have some common conclusions that the level of attention paid to environmental education is very low. Moreover, the focus in many of the curricula of primary till the tertiary levels is more on knowledge acquisition rather than practical activities and attitude formation. The connection between environmental education and local environment context; the relevance of environmental education objectives, contents that serve the objectives and the means to achieve the objectives particularly the teaching methodologies and mode of

evaluation are the least studied aspect of environmental education. Thus, this study targets to investigate the contextual relevance of environmental education *about* (knowledge), *in* (methodology) and *for* (pro-environmental behaviour and action) the local environment. The study is conducted in two selected secondary schools situated in different social and biophysical settings.

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# 4 Research Design and Methodology

## 4.1 Introduction

In this chapter, the chosen research design and methodology for this particular study are presented. Accordingly, varieties of theoretical assumptions in relation to research design and methodology approaches are discussed and assessed in line with the choices and decisions made in each and every step of the research process which includes the choice of the research design, the selection of data collection methods, the techniques used to select sample research participants, the method of data presentation and analysis and the rationale behind the choice of the research sites. The actual experiences of all practical applications of the research design during the field work are also described.

## 4.2 Qualitative and Quantitative Paradigms

> *The distinction between quantitative and qualitative research marks a series of differences in approach to research. At the most surface level, quantitative and qualitative researchers base their conclusions on different kinds of information and employ different techniques of data analysis (Blanche, M., Durrheim, K. & Painter, D. (2006: 47).*

Paradigm is defined as 'a set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents the world view that defines, for its holder, the nature of the "world," the individual's place in it, and the range of possible relationships to that world and its parts (...)' (Guba, E. & Lincoln, Y., 1994:105). Paradigms are considered as 'basic belief systems' that are built and grounded on the philosophical assumptions about ontology (reality), epistemology (knowledge) and methodology ('*how should we study the world*?') (Blanche, M., Durrheim, K. & Painter, D., 2006; Guba, E. & Lincoln, Y., 1994; Patton, 2005). Thus, the dividing line between quantitative and qualitative research is deeply embedded in their respective epistemological and ontological assumptions - which are again apparent in their methodological orientations.

Quantitative research, in its epistemological assumptions (*Positivism paradigm*), claims that knowledge is discrete, objective, empirically tested and reached through deduction (Theory – hypotheses - data collection - Knowledge) (Bryman, 2007).Whereas, from the epistemological view point of qualitative research (*Interpretivism paradigm*), knowledge is the subjective based on contextual interpretation and understanding of the social phenomenon

- which implies the social world cannot be studied in the same way the natural science does on objects. As Brayman (2007:15) describes, "(...) the subject matter of the social science – people and their institutions – is fundamentally different from that of the natural sciences. The study of social world therefore requires a different logic of research procedure (…)." Thus, in qualitative research, knowledge about the social world is explained through the contextual meaning and understanding of a particular social phenomenon which can be described in words rather than quantified forms and numbers.

Similarly, the ontological considerations according to Baryman (2007:18) is "the question whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors." These two distinctive ontological assumptions, which referred as 'objectivism' and 'constructionism', guide the methodological considerations of quantitative and qualitative research strategies. According to *objectivism* - which is favored in quantitative research - the social world has an observable, verifiable and objective reality and truth that needs to be tested and measured scientifically. The reverse sounds true from the perspective of *constructionism* in which the social world is thought to have multiple versions of realities and knowledge about the social world is indeterminate. In this regards, Guba, E. & Lincoln, Y. (1994:105) clarify the philosophical assumption behind *constructivism* as, " Realities are apprehend-able in the form of multiple, intangible mental constructions, socially and experientially based, local and specific in nature (…), and dependent for their form and content on the individual persons or group holding the constructions." Qualitative research is characterized for having the ontological orientations of *constructivism*.

Our assumptions and perspectives about the social world; what we perceive as real in it and what we think worth to know about it all give us the directions as to how we go to know about it. Likewise, these contrasting ontological and epistemological orientations held by quantitative and qualitative research traditions are also manifested in their methodology.

More specifically, the purpose of a study, the source of data, the data collection techniques and the methods of data analysis are the major factors that determine the choice of qualitative and quantitative research types. It is worth considering initially whether quantitative or qualitative research method is best fit to answer the research questions. This is mainly because the decision made at this stage affects the whole research process from the beginning

through the end. The choice of the research methods is not based on merits rather the purpose of a particular research, the nature and context of the things to be studied, the time and capacity of the researcher and various other things that influences the choice of the research type

For instance, the purpose of a particular quantitative research may be to give a statistical justification based on numerical data about the relationship between certain variables while qualitative research try to provide an in-depth description of insights and perspectives about the thing being studied. Thus, both research traditions are alternatives of researching with their own strengths and weaknesses. Finding compatibility between the purpose of the research, the research question(s), the practical situation(s) and the choice of the research type is vital to achieve the desired goal of any research (Maxwell, 2005; Blanche, M., Durrheim, K. & Painter, D., 2006).

Thus, from various points of view, qualitative research method is chosen to carry out this study. Below are some of the rationales behind the decision made to execute different methods of qualitative research in order to answer the research questions of this study.

## 4.3 Why Qualitative Research Approach?

> *Some questions lend themselves to numerical answers; some don't. If you want to know how much people weigh, use scale. If you want to know if they are obese, measure body fat in relation to height and weight and compare the results to population norms. If you want to know what their weight means to them, how it affects them, how they think about it and what they do about it, you need to ask them questions, find out about their experiences, and hear their stories.* Patton (2005:13)

The primary goal of this study is to explore the contextual relevance of environmental education in relation to the physical and social environmental situations of the locality where in school function. Given this in mind, trying to understand the perspectives of various participants on the issue being studied, how participants' perspectives influence their behaviour and actions, and how their behaviour and perspectives are influenced by the social world and physical contexts they are in - require an open-ended, flexible, inductive approach of exploring the phenomena. Maxwell (2005: 22) describes one of the goals of qualitative studies, "Understanding the particular context within which the participant act, and the influence that this context has on their action."

Thus, qualitative approach is chosen to uncover the subjective understanding and experiences of different group of people who are functioning in different contexts but interlinked with environment and environmental education. To this end, an attempt is made to understand the views, perspectives and experiences of teachers, school leaderships and various stakeholders on student' schooling, environmental education, local environmental problems and challenges. Besides, students' perceptions and understandings towards their schooling, local environmental problems and their roles and responsibilities in relation to environment are subject to the qualitative exploration of this study.

Below is a brief on the nature of the research design of this study. As Blanche, M., Durrheim, K. & Painter, D. (2006:47) state that "deciding whether to use quantitative or qualitative has many implications for research design: it has a variety of consequences for sampling, data collection and analysis." Now, let us see how these consequences revealed as a result of the choice of qualitative approach as far as this study is concerned.

## 4.4 Research Design

Research design, the very heart of a research, is a plan of action that is designed to systematically answer the research question(s) of a study. Blanche, M., Durrheim, K. & Painter, D. (2006:34) described research design as "a strategic framework for action that serves as a bridge between research questions and the execution or implementation of the research." Research design decides each and every step all the way through the research process: what types of data need to be collected, from whom it needs to be collected, how and when it is going to be collected and how to organize and analyse the collected data in line with the purpose of the study (Yalew, 2006; Blanche, M., Durrheim, K. & Painter, D., 2006). The goal of the study, to which the research design targets to achieve, is one of the major issue that determine how the research is designed in a manner that adequately address the research question(s). The paradigm choice, the overall context of the research site and the nature of participants are also some of the factors that help to decide the type of research design.

Accordingly, comparative research design was chosen to study the cases of environmental education in the two schools. According to Bryman (2007:58) "It embodies the logic of comparison in that it implies that we can understand social phenomena better when they are compared in relation to two or more meaningfully contrasting cases or situation." Since this

study is conducted to see the contextual relevance of environmental education in socially and physically different environmental settings, locational differences was the cause of the research site selection. As Bray (2007:88) noted, "A prerequisite for any comparative study is to establish the parameters of the chosen units of analysis." As it is described in detail in the later sections of this chapter, there are numerous similarities between the two sampled schools except the visible and invisible differences in connection to the particular environmental problems and challenges and particular social and environmental priorities that surround the schools and the nearby localities. Thus, this study considered the comparative roles, values, and relevance of these social and physical contextual differences have on the unit of analysis (environmental education) of this particular research.

Accordingly, the choice of data collection methods, the selection of research sites and study participants, the sampling techniques used, and the method of data analysis are all guided by a qualitative approach of comparative research design. In the following sections, the individual detail account of the data collection instruments, the sampling techniques, and the data analysis procedure and methods are discussed.

## 4.5 Data Collection Methods

> *The implication of thinking about purpose and audience in designing studies is that methods, no less than knowledge, are dependent on context. No rigid rules can prescribe what data to gather to investigate a particular interest or problem. There is no recipe or formula in making methods decisions (…). In research as in art, there can be no single ideal standard. Beauty no less than "truth" is in the eye of the beholder (…)* (Patton, 2002:12).

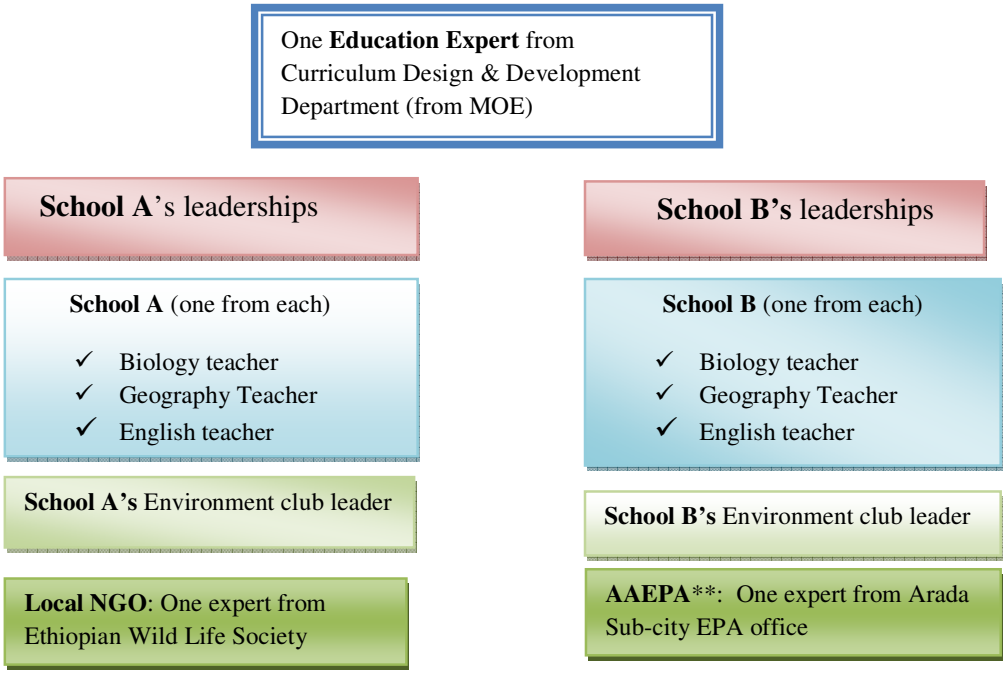
The final outcome of a research is highly determined by the type of data one collects during the research process. Similarly, the quality of the collected data is dependent on the strengths and weaknesses of the data collection instrument(s) implemented (Yalew, 2006). The selection of data collection methods is also influenced by the research type, the type of research participants and by the amount of time and financial capabilities of the researcher. Accordingly, qualitative data collection methods such as, semi-structured interview, focus group interview and unstructured observation are chosen to gather data from the selected samples. The next sections are about the basic details of each data collection instrument including how the researcher applied them during the field work period.

### 4.5.1 Semi-structured Interview

> *Conducting an interview is a more natural form of interacting with people than making them fill out a questionnaire, do a test, or perform some experimental task, and therefore it fits well with the interpretive approach to research. It gives us the opportunity to get to know people quite intimately, so that we can really understand how they think and feel. (Blanche, M., Durrheim, K. & Painter, D., 2006:297)*

The conversational kind of face to face interactions, between the interviewer and interviewee, the opportunity for flexibility based on the atmosphere of the interview session, the chance of explaining unclear questions, the greater possibility of catching non-verbal reactions, etc all provide the researcher with the chance to gain an in-depth insights and understanding about the subject being studied. People's experiences, perceptions, perspectives and emotions towards the subject being studied can be better grasped through interview (Maxwell, 2005; Yalew, 2006; Blanche, M., Durrheim, K. & Painter, D., 2006).

Thus, semi-structured interview was chosen to collect data from the selected sample of teachers, school leaderships, schools' environment club leaders and various officials from different government and non-government offices. Different guidelines for different interviewees were prepared on the bases of certain themes that are compatible with the issues raised in the research questions. Biology, geography and English teachers from the two sampled schools were interviewed individually. People from the school leadership position and expertise from the Curriculum and Development Department in the MOE were also included in the interviews. In addition, people from local NGO and government AAEPA offices whose official duties are interlinked with environmental education were interviewed on their role related to education. Except a few, many of the interviews are recorded based on the consent of the interviewees. The amount of time that each interview session lasted varies from interviewee to interviewee namely between 30 minutes and an hour. Figure 4.1 is a diagram presenting the structure of participants in the semi-structured one to one interviews.




- **EE***: Environmental Education
- **AAEPA****: Addis Ababa Environment Protection Authority

**Figure 4.1** Number and categories of the informants of the one to one interviews

### 4.5.2 Focus Group Discussion

> *Whereas, in interviewing an individual, we develop an understanding of subjective experience, when we work with groups we can gain access to intersubjective experience. Intersubjective experience is experience shared by a community of people. In accessing intersubjective experience through group interviewing, we also gain access to understanding differences between people whom we might previousely have thought of as a homogenous group (*Blanche, M., Durrheim, K. & Painter, D., 2006).

Group interview was the second data collection method used to gather qualitative data from those systematically selected sample groups, mainly 10$^{th}$ grade students from the two schools. There were a total 26 students who took part in four group interview sessions (two sessions from each school) with 6-7 participants in each session. Semi-structured interview format was used during all focus group discussions where open-ended questions were presented to all group participants. During the participant selection process, an attempt was made to involve and maintain equal participation of both genders in all group interviews. To maintain the smooth interactions and discussions between participants, group interviewees were made aware of all the necessary rules, responsibilities, norms and expectations of the group

discussions. Except slight differences, almost each focus group session took nearly an hour and half. Refreshments were served to participants all the way through the discussions.

In order to avoid the possible communication barrier and put participants at ease, all the focus group discussion sessions (except a few cases) were conducted in students' first language – *'Amharic'* - the official language of Ethiopia. Apart from the use of 'Amharic' as a medium of all group discussions particularly in School A in Addis Ababa, a few students in 'School B' used their mother tongue –'Oromiffa' during the group interview sessions. Thus, in School B, 'Amharic-Oromiffa' translator participated to translate the interview questions from 'Amharic' to 'Oromiffa' and students' responses from 'Oromiffa' to 'Amharic'. While keeping important hand notes in parallel, all the discussions were recorded after having the full consent of all focus-group participants.

### 4.5.3 Observation

> *The 'data' in a qualitative study can include virtually anything that you see, hear, or that is otherwise communicated to you while conducting the study; there is no such thing as "inadmissible evidence" in trying to understand the issue or situations you are studying(…).Qualitative data are not restricted to the result of specified 'methods'; as noted earlier, you are the research instrument in qualitative study, and your eyes and ears are the tools you use to make sense of what is going on.* (Maxwell, 2005:79)

Unstructured observation during all the field period was conducted in order to gain an insight about the overall physical and social environments that surround the two schools. The very rationale for conducting unstructured observation is attached to the identification of the possible roles of the physical and social environmental contexts where the two sampled school are situated have on environmental education and vice versa. Thus, observing the physical and social settings of the two schools was found important in order to see whether or not these contextual settings are relevant in relation to what is going on in the classroom teaching and learning process and vice versa. Thus, the inside physical setting of the schools such as, physical space and size of the schools compound, the physical building of the schools and the learning facilities (library, laboratory, model show rooms and model learning sites) were the foci of the observation. The outside physical and social settings that surround the schools compound were also the focus of the observation. A range of notes were kept including photographing.

### 4.5.4 Other methods

Document review was part of the preliminary research process in which students textbooks were subject of the review. Accordingly, biology, geography and foreign language textbooks (mainly English) were assessed in terms of the range of environment related content integration. The review was instrumental to identify target informants for the interviews as well as serving as a base for formulating some of the semi-structured interview questions as well as questions presented in the focus group discussion sessions.

In addition to the document reviews, a kind of close ended questionnaire was also administered to collect very basic data about students' family background, students' sources of general environment related knowledge and local environment knowledge, students' experiences and activities in relation to environment. In addition, students were asked to list down some of the most serious environmental concerns which are particular to their local area. Finally, students were asked to indicate which $10^{th}$ grade subject - they think present more information about environmental issues. The data obtained from the administered questionnaire was very instrumental to have a general overview about the basic similarities and differences (if there is) between students of the two schools with regards to their perspectives about their local environmental problems. Besides, the data fill some gaps that cannot be easily filled through students' focus group discussion.

## 4.6 Research Site

> *Knowing that one cannot study everyone everywhere doing everything, even within a single case how does one limit the parameters of a study?* (Miles and Huberman, 1984, as quoted in Maxwell, 2005:87)

In this study, the selection of the research site was based on a purposeful selection. Maxwell (2005:88) describes purposive sampling as 'a strategy in which particular settings, persons, or activities are selected deliberately in order to provide information that can't be gotten as well from other choices.' Three main reasons can be explained behind the purposive sampling technique used to select the two schools as the research sites of this study. The first parameter, as Maxwell (2005) termed it, is to achieve "typicality of settings." Here, 'typicality of settings' refers to the compatibility of the research site with the issue being studied (unit of analysis) particularly for the comparative aspects of the study. Thus, the choice of the research site is attached to the goal of the study. Secondly, the researcher's relationship with

study participants is additional reason for purposeful decision as to where the study shall be conducted. Lastly, the researcher's 'knowledge of the setting of the study' and other practical reasons are also among the rationales that informed the choice of using purposeful research site selection method.

Since the main intention of the study is to see the contextual relevance of environmental education in secondary schools in Ethiopia, two schools are selected deliberately for the mere reason that both of them are located in different contexts- one in very urban and most populated city of Addis Ababa, while the other school is selected from relatively small city with quite different physical contexts named Bishoftu (Known formerly as Debre Zeit), a city surrounded by about seven lakes (see appendix 8). This would give the study a comparative account as to how the school teaching learning process consider and contextualize those environment related lessons and issues within their respective local realities. Each locality has its own environmental concerns and problems to which the researcher wants to investigate how schools are making connections between what is being taught inside the school with the local environmental related problems.

Accordingly, School A which is one of the public schools in Addis Ababa, was chosen using purposive sampling. Addis Ababa is the most populous city in Ethiopia with an estimated population of over 4million (UN-HABITAT, 2008). According to some reports, the city has a wide range of social and environment related problems. In Ethiopia, there are three types of schools: Government schools, public (community schools) and private owned schools. The first type of school is meant only for those students who are from lowest class of socio-economic background with very limited financial ability to pay for school fee. The second type - public school - is a kind of school with relatively an affordable fee than the private owned school in which students who are from middle income family attend. Thus the researcher has chosen the given public school (*School A*) with the assumption that it represents the middle class society of Addis Ababa and it can also be considered as an average school in terms of facility and resources. Since there is a huge gap between government and private owned schools in terms of facilities and teachers qualifications, taking public school as a sample may relatively give a balanced view of schools in Addis Ababa. In addition, since the researcher had been a teacher in School A by 2007, dealing with the gatekeepers became relatively easier than choosing a school from so many other public

schools in Addis Ababa. But interviewed students, teachers and the school principal are all new faces for the researcher that it had no influence on the data collection process.

On the contrary, the second school - *School B* was chosen from a city called Bishoftu - 50km away from Addis Ababa. The City is estimated to have a population size of over 100 000 thousands (FDRE- PCC, 2008). The city is surrounded by about seven lakes which make the city to have quite different physical and environmental contexts with Addis Ababa. School B is a one of government secondary schools in the city of Bishoftu. The school has over three thousand students attending grade nine and ten which can be considered very large population compared to School A that has a total of 430 students in grade 9 and 10. All the teaching staff has got their first degree and a few of them have got a master's degree in their field of specialization. The researcher has also witnessed similar teachers' level of qualification in both sampled schools.

**Map 4.1** The location of Addis Ababa and Bishoftu(Debre Zeith) from where School A and School B are chosen.

## 4.7 Sampling of Research Participants

> *Selecting those times, settings, and individuals that can provide you with the information that you need in order to answer your research questions is the most important consideration in qualitative selection decision (Maxwell, 2005:88).*

As a qualitative study, all the sampling processes - from the choice of the research sites to the selection of individual research participants - are guided by purposeful sampling techniques. Selecting an appropriate and relevant research sites which are compatible to the purpose of the research questions and choosing 'information rich' research participants from those selected sample cases or sites demands purposive sampling methods (Bryman, 2008; Patton, 2002). In the following paragraphs, the rationales and procedures which dictated the sampling aspects of this study are discussed in detail.

On the bases of comparative relevance to the research questions of the study, two schools are purposefully chosen by considering their contextual (physical and social settings) differences where in the schools situated (justify with theory). Accordingly, as described earlier, School A and School B are chosen from the cities called Addis Ababa and Bishoftu respectively

Similarly, choosing appropriate research informants from those selected schools was another process that demanded purposive sampling techniques which was partly guided by prior document reviews. In the prior document review phase, biology, geography and English subjects were identified as more relevant among $10^{th}$ grade school subjects that are closely connected and treat environmental education more than other subjects of same grade. Then, biology, geography, and English subject teachers were one of the target groups of the study from which one from each subject teacher group were chosen from the two schools for one to one interviews. Thus, a total of six teachers from three school subjects (two teachers from each subject) were interviewed.

The selection of $10^{th}$ grade students from the large student population found in the two research sites was also part of the sampling process. Accordingly, a total of 26 students, who took part in the focus group discussion, were randomly selected using systematic sampling technique from the two sampled schools (13 students from each school). Although qualitative sampling is heavily relied on purposeful sampling techniques (Bryman, 2008; Maxwell, 2005; Patton, 2002), there are still possibilities and cases to apply random sampling technique particularly when there are larger sample size within the same informant cohorts or large group of interested participants (like in the case of hundreds of $10^{th}$ grade students in the two

sampled schools). In this case, using random sampling technique is not intended to look for representativeness, but for creating credibility (Patton, 2002; Maxwell, 2005). The decision on the given sample size particularly with regards to students who participated in the focus group discussions (13 students from each school), is not similarly to achieve representativeness, rather it is because of, in Patton (2002) terms, "the trade-offs between breadth and depth" in which small number of participants were chosen to gain an in-depth and rich information than large number of samples with a little depth given the same limited time and logistical capacity at hand. As Patton (2002:244) suggests, "There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry, what's at stake, what will be useful, what will have credibility, and what can be done with available time and resources."

In addition to the participation of schools' subject teachers and 10$^{th}$ grade students, involving people who are in the schools leadership positions was considered strategically appropriate in order to collect data from those 'information-rich' research participants. Thus, one informant from each school's leadership was selected for one to one interview.

As noted earlier in this chapter, research informants are classified into two categories: major research participants and supporting research participants. The former include school subject teachers, 10$^{th}$ grade students and school leaderships. Whereas, the supporting informants are various research participants who are taken from Ethiopia Environment Protection Authority, Addis Ababa Environment Protection Authority, Ministry of Education and Local NGO. The classification is made on the bases of relevance and closeness of the participants to the issue being studied. Bearing this in mind, the supporting research participants were selected in the following ways.

Prior to the field work, I was only interested to involve research participants, such as students, subject teachers and school leaderships of the two sample schools. However, in the process, I learnt and believed on the importance of involving other parties who have - one way or the other - an influence with schools in relation to environmental education. This was done just to bring data from various sources which may add a new perspective and insight in to the issue being studied. As a result, some selected people from Ethiopia Environment and Protection Authority, Addis Ababa Environment and Protection Authority, local NGO, the Ministry of Education particularly from Curriculum Design and Development Department and local municipality - are all made to participate in the study. The very reason that all these new

participants added is just to know and give a glimpse of the overall structure of environmental education at various levels and the interplay between them and the schools.

Accordingly, one key informant from each governmental and non-governmental organization and office was purposefully chosen for one to one interviews in order to discuss issues that connect the organizations with environmental education and environment club activities of schools.

## 4.8 Field Work

The field work was carried out between December 20, 2011 and February 10, 2012. The letter of cooperation that I handed to the schools' administration was very instrumental to get a warm welcome and kick off the sample selection process as I planned. School A and School B principals were very much helpful to convince teachers, students and environment club leaders to participate voluntarily in the data collection process. Consequently, the researcher selected the key research informants and arranged time schedule for every interview and focus group discussion sessions together with the chosen teachers and students. As a result, the data collection process was moved smoothly and was completed without facing any deterrent situations.

All the one to one interview sessions and focus group discussions with all research participants were carried out using the official language ('*Amharic*') of the country as a medium. As exceptional case, some of the students who took part in the focus group discussions from School B were allowed to use their mother tongue in order to put them at ease to understand the question well and to respond in a way they like to say. Thus, translator was used to mediate the focus group discussions.

The focus group discussion with students had various features among which the difference between focus group participants in School A and School B in terms of articulation and responsiveness was a bit visible. Students in School A were very articulate and reflective than students in School B - who demanded a lot of follow-up and eliciting questions in order to get them give the best of their responses. Relatively, some of the group participant particularly female students in School A were more dominant and reflective than the others. However, the disciplinary procedures set before the start of the discussion was very helpful to give every participant equal chance to have a say on every issue raised during the group discussion. The

proportion of participants among male and female students who took part in the focus group discussion sessions was almost equal.

The one to one interview with teachers, school leaderships, environment club leaders, experts from various organizations listed above were smooth and conversational kind. Luckily, all of my interviewees were very cooperative, willing and relaxed to share their views, experiences and perspectives on the issues raised in the interviews. As I learnt from many of the interviewees during the interviews as well as in the informal personal conversations, the issue of environment is very vital, timely and critical to Ethiopia. Though many of them expressed their serious concerns on environmental related problems, they also confessed their weak efforts and irresponsibleness to take action.

Finally, my field work concluded upon receiving letter of confirmation from both schools regarding the things I did during my stay in the schools.

## 4.9 Data Analysis Procedures

> *Because qualitative data deriving from interviews or participant observation typically take the form of a large corpus of unstructured textual material, they are not straightforward to analyse. Moreover, unlike quantitative data analysis, clear-cut rules about how qualitative data analysis should be carried out have not been developed. (Bryman, 2007:538)*

The initial phase of the data analysis process was started by listening to the audio recoded interviews and focus group discussions and reading the field notes including notes on the things observed. This first phase was important to decide the next step and tasks of the data analysis process. As Maxwell (2005:96) suggests, 'listening to interview tapes prior to transcription is also an opportunity for analysis.' Following the first audio listening phase, transcribing (transforming) the audio data into written script took the second phase which was one of the most time consuming tasks during the research period. Then, coding the data in order to create various categories based on similarity of opinions, ideas and issues was done through multiple re-reading of the transcribed scripts. At this stage, the data moved into a new level where the bulk of the raw data was gradually squeezed in some form of substantive categories. The substantive categories are compartmentalized into various topics and sub-topics and presented in a manner that fits to answer- one way or the other- the main research questions of the study.

In order to provide readers with a clear guide to identify different informants in next data presentation and discussion chapter, responses of different key informants are given categorical coded names in the form of abbreviation so that readers can easily identify and understand who responded what on different issues. For instance, quotes from School A and School B students are coded as A-S and B-S respectively- which refer to School A student and School B student. Number and date also come at the end of each abbreviation to identify between interviewees and the month when the interviews were conducted. Similarly, interviews with subject teachers of School A and interview with subject teachers of School B are also coded as A-T and B-T followed by number and date. The remaining key informants are not coded in abbreviated form since only one key informant from each school and organization is chosen and they are less confusing and better presented under the unabbreviated names.

## 4.10 Validity and Reliability

> *There is no formula for determining significance. No ways exist of perfectly replicating the researcher's analytical thought processes. No straightforward tests can be applied for reliability and validity. In short, no absolute rules exist except perhaps this: Do your very best with your full intellect to fairly represent the data and communicate what the data reveal given the purpose of the study (Patton, 2002:433).*

The difference between quantitative and qualitative research designs is also manifested in their particular methods of dealing with the issues of validity and reliability. In quantitative research, the researcher, in advance, build the necessary protective blockage to control the possible anticipated and unexpected validity treats of intervening variables (Blanche, M., Durrheim, K. & Painter, 2006; Maxwell, 2005). Maxwell (2005:107) lists some of the prior control mechanism such as "(…) control group, statistical control of extraneous variables, randomized sampling and assignment, the framing of explicit hypothesis in advance of collecting data, and the use of tests of statistical significance." This is not the case and way of dealing with validity treats when one comes to the qualitative research design. Trying to maintain and build the credibility of the interpretation and explanation of the findings is a way of claiming validity for qualitative researchers (Blanche, M., Durrheim, K. & Painter, 2006).

There are various ways of maintaining credibility or in other words how one rule out the possible 'validity treats'- 'how could one be wrong?' Long term participant observation, gathering "rich" data, respondent validation, interventions, searching for discrepant evidences, triangulation and comparison are some of the mechanisms of maintaining credibility in

qualitative study. However, depending on resources, time and contextual situation, the method one uses to eliminate possible validity treats vary. Thus, as far as this study concerned, the researcher chose to minimize the possible validity treats through the use of different sources of data (key Informants) and data collection tools. Thus, using teachers, students, school leaderships, environment club leaders and other people from different governmental and non-governmental organization as a source of data is one way of minimizing the risk of less credibility than using only single informant. Similarly, the application of different methods such as, semi-structured interviews, focus group discussion and observation is additional way of triangulating the result outsources by using different technique.

Thus, the researcher used triangulation method to maintain the validity and reliability of the data by triangulating the data taken from different key informants using different method of data collection instruments. Figure 4.2 is a diagram representation of how the data of the study are triangulated by involving different research participants and by employing different data gathering tools.

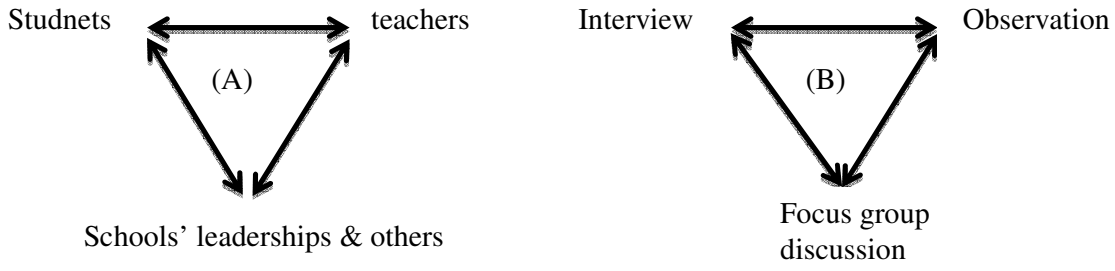



**Figure 4.2**. Triangulation methods using different informants (A) and different data collection methods (B). (Adapted from Yalew, 2006:238)

## 4.11 Concluding Remark

As guided by the purpose of the study, the whole process of data collection was carried out primarily through the application of different qualitative research methods. Consequently, substantial bulk of qualitative data was collected from different key informants. This large volume of qualitative raw data - after several consecutives steps and processes which included data transcription, coding, itemization and conceptualization - turned into some form of presentable data. Again the final presentable data, which are sorted out on a concept and

theme based approach, are presented and analysed in the following chapter in a manner that fit compatible to the purposes and the main research questions of this comparative study.

# 5 Data Presentation and Analysis

## 5.1 Introduction

Within this chapter, the qualitative data which were gathered through individual interviews, focus group discussions and unstructured observations are analysed and discussed. As supplementary to the main qualitative findings, quantitative data that was obtained by students' questionnaires is also presented in between the major story of the study.

This data presentation and analysis chapter presents what is the state of affair in the two schools in relation to environmental education ***about***, ***in*** and ***for*** the environment with particular reference to environmental challenges, concerns and realities of the respective locality where the two sampled school are situated. Comparative dichotomy between participants' perspectives of the two schools in relation to environmental problems peculiar to their local contexts is also subject of the data presentation and analysis of this chapter. Having presented what the qualitative data uncover with regards to the main research questions, the remaining sections of this chapter are devoted to analysing the possible rationales and factors that exert an obstacle for the whole environment related teaching and learning process.

## 5.2 School A

### 5.2.1 Learning Environment[3]

Based on what has been grasped through unstructured observations, and from those repeatedly heard stories during the individual interviews and focus group discussions with students, teachers and school leaderships, the overall learning environment situation of the two schools is considered as one of the major aspects that has a direct impacts on the processes and outcomes of environmental education and related school activities. The following are what the unstructured observations that the researcher made during the field work revealed about the physical and social environment of the two schools.

[3] ***Learning Environment***: *The 'learning environment' concept focuses on the school physical and social environment in terms of the building design, size of the classrooms and the general infrastructure including library facilities, staffroom , toilets , school compound and play ground. A school's social, cultural and economic context is another component of 'learning environment'.*

To begin with the outside physical environment, the two schools are situated in very different physical and social settings. The first school, School A, is found in one of the busiest centre of Addis Ababa. The surrounding area is highly overcrowded with different business and other activities. For instance, there are numerous cafes, bars, restaurants, 'khat bets'[4], music shops, churches, university campuses, various street trade activities, etc. are all found in the same area approximately within the range of 50 to 300 square meter. The school is located in the middle of this ever busy city centre. Describing this situation, one of the interviewed students complained that:

> *What is always surprising to me is how come these many 'khat bets', bars, music shops and all other unnecessary business activities are opened around our school and causing a lot of problems to us. You know, many students are easily attracted to these bars and 'khat bet' and they visit them every day (since many of us are teenager and immature) and return to class intoxicated and disturb the learning spirit of the whole class. (A-S4, -01/2012).*

Another student had a similar remark,

> *When we are in class, the weather is very hot inside so the doors and windows always kept open, but this allow a loud disturbing noise to come in and disturb us to attend class attentively. I remember once this music and video shops and local bars were made not to open music loud, but it went well only for a short period of time. They started again opening music with loud mega speakers. (A-S8, - 01/2012).*

In general, the entire surrounding area around the school is very noisy due to its closeness to the motorway, music shops, bars, cafes, and various business activities including street trades. This has an immense effect in the teaching and learning process that is going on inside the school compound.

The inside physical setting of the school is also quite different from the other school. It has a very narrow compound in which students have very little space to play and do any kind of out of classroom curricular as well as extra-curricular activities. The entire space in the school compound is occupied by classroom buildings and this situation has created an obstacle for teachers to build various learning model sites and model display centres. One of the interviewed biology teachers describe the problem as:

> *For example, we teachers always want to build various model learning sites in our school compound where we teach students practically how they can produce and use biogas, bio-fuel*

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[4] ***Khat****: An evergreen shrub (Catha edulis) native to tropical East Africa, having dark green opposite leaves that are chewed fresh for their stimulating effects. Khat is legal in Ethiopia.*
***Khat bet****: refers to a kind of house where people gather together to chew khat and to spend the day together having fun, discussion, etc.*

*and recycling of different used materials. But, the lack of enough space discourages us not to do so; rather we stick only in lecturing the theory using chalk and board. (A-T3, - 12/2012)*

Quite similar comment was given by one of the students, and she said:

*It is helpful for us. Because once we are taught in school how to build biogas, we don't necessarily to have it in school. But you cannot find a free space in our school to build biogas display, In fact there are schools that have biogas display and it is the weaknesses of the school for being unable to take us to those schools and show us how biogas works practically. It is true that we understand the concept well when we learn more practically. (A-S6, - 01/2012).*

The principal of School A, confessing his personal weaknesses, described how the physical situation of the school is less encouraging doing more on environment related things:

*You already have seen our very small school compound which is highly crowded with classroom buildings without having any space left for other purposes that a school need to have. As a person in a school leadership position, I am not playing up to the expectation, but some time the situation itself governs your activities. For instance, when I was in other school, I was able to plant over four hundred trees together with teachers and students. Here, I did nothing.*

As it is also witnessed during observation periods, there are no playing grounds for any kind of sport activities where students play in their free time. It is just class room buildings and a very small free walking space seen in the entire compound. Bearing the given social and physical environmental contexts of School A in mind, let us move to the findings with regards to environmental education *about, in* and *for* the environment as well as how the above described School A's physical and social learning environment and contexts affects the teaching and learning process and vice versa.

### 5.2.2 Environmental education *about* the environment

Knowledge, information, fact, theories about the biophysical environment comes first in terms of priority order as far as environmental education is concerned. As discussed in the theory chapter particularly in the 'Early Us linear model' and 'Sociological model' of pro-environmental behaviour (p27-29), people need to have the knowledge *about* the environment in order to develop a positive attitude and pro-environmental behaviour – which enable them act accordingly (Kollmuss & Agyman, 2002). With this in mind, the one to one interviews and focus group discussions I had with teachers and students have confirmed that students are learning about the basics of environment through classroom lessons given in the subjects such as: English (in the form of reading, listening, speaking and writing), biology (as part of the topics included in the syllabus) and geography (topics in the syllabus). Teachers said that although little room is left to teach live with real interaction within the biophysical

environment by taking students outside classrooms, students are being familiarized with the primary knowledge of climate change, environment related problems and potential future dangers as a result of the current malpractices of industrialization and environmentally irresponsible human actions.

One of the geography teachers explained the overall scenario as far as the subject he taught is concerned as:

> *Geography is all about environment. We teach about economic, physical, population geography. Each demands a lot of time to be covered in detail. You might need a semester if you want to talk in depth even about population geography. So, the problem is most of the topics are very general and sometime your students even might be confused on what you teach to them. For instance, when I talk about drought and its impact, I talk about how it kills cattle and similar consequences. But student may not get it as something real and visible problem and understandable while living in the centre of a big city. Take teaching about Chlorofluorocarbon (CFC), it is always a distant issue and theory for my students to understand it well (A-T1, -01/2012).*

As learned from the responses of the subject teachers, many of the topics incorporated in the syllabus are very general topics about environment with little local environment related issues. Besides, some of the topics like Ozone layer depletion and other complex concepts require additional teaching aid for students to thoroughly understand them theoretically. As teachers remarked, unless there is a well equipped science laboratory, it is obvious that many of the issues remain abstract to students. Thus, it is true that students are learning about environment in general but the way they learn is not satisfactory enough for students to grasp various complex issues within environment.

Coming to the issue of environmental education *about* the local environment, many of the subject teachers confessed that they do not teach students more specifically about their local environmental issues, problems and solutions. Many of the students who participated in the focus group discussion also asserted that they are not being taught about their local environmental problems except a few rare examples that teacher use to give when there are some related lessons. To take one as an example among similar comments given by focus group participant students, one said:

> *We are just learning only lessons presented in our main textbook since these lessons appear in exams particularly in the national exams. So, I do not remember a lesson taught in connection to our local place and environmental problems. Teachers sometimes raise local issues for the sake of giving examples but no local issue that appears in exams (A-S4,- 01/2012).*

As learnt from responses given through students' questionnaire, there is a huge discrepancy between environmental concerns and problems which are specific to the case of School A and

the content of lesson students are being taught in classrooms. For instance, students repeatedly complained about the loud noise that comes from the nearby surrounding particularly from the nearby music shops, bars, restaurants, and from various forms of business activities. Hazardous black smoke released from industries and old cars; the poor waste disposal practices of the community, broken sewage lines and poorly managed garbage sites are some to mention among many serious local environmental concerns listed by students, teachers and school leadership. In addition, gradually increasing number of bars, '*khat bets'* and different business activities in their school surroundings are some of the serious treats for students' undesirable behavioural changes and bad habits. However, almost none of these environmental problems and challenges specific to the given locality were subjects of the classroom teaching and learning process.

### 5.2.3 Environmental Education *in* the environment

Environmental education ***in*** the environment is all about the pedagogy of environmental education. The way the teaching and learning process is handled by teachers matter a lot as to the extent of achieving educational objectives set at the beginning (Orr, 1991). Environmental education ***in*** the environment refers to the teaching methodology in which teachers use the local biophysical and social environment as a medium of teaching *about* environmental issues in order to give learners a 'hand-on' or 'real world experiences' (Sobel, 2004).

In this regards, the finding of the study tells us that the teaching approach being underway is highly teacher dominated in which applying the idea of education ***in*** the environment seems far dream due to various shortcomings. Most of the focus group participants in School A underlined that there are a number of interesting environment related lessons particularly in biology and geography subjects though the lessons are presented merely theoretical without an exposure to practical applications and examples. One of them explained the situation as:

> *To me, the lesson does not help because there are no laboratory exercises where we test things for real. When we attend class, we do not get any practical examples in which we can see as to how those lessons we get theoretically be applied in practice. Teachers do not do this; they just give us theory and information. They usually come and write everything in the black boards (A-S9, -01/2012).*

Teachers, on the other hand, seem more inclined and interested on stating why they are not doing the way they should do the teaching with more practical experiences and examples. To mix some instances from teachers' interviews, let me take some quotes:

*The fact is students are very much interested on practical things. Even some students who are not active in class room learning process become active when I ask them to do something practical outside class room. I remember I once took my student to Black Lion Hospital which is very far from our school. They were all happy for they went out for field, but when we return back we need to have returned to school on foot due to absence of budget even for the simple transport cost. Though I believe that student learn better through practical learning, I am not doing that because of various reasons (A-T1, -01/2012).*

My interviewees, particularly teachers, justified that in the learning environment of large class size (up to 70 students per class), poor and insufficient teaching resources including laboratory and with very little extra budget allocated for field works, it is practically impossible to take students to the nearby biophysical environment in order to teach them about environment. Besides, high teaching load that each teacher execute within a week (up to 30 period per week), large content that need to be covered within a semester and lack of teachers commitment to do the best under those pressures are some to list among the various factors that limited the possibilities of teaching environmental education ***in*** the real environment.

Lastly, teachers have also emphasized how the 10$^{th}$ Grade National Examination (EGSECE)[5] dictates the teaching learning process in that the classroom teaching learning process is more directed towards preparing students for the national exam. The 10$^{th}$ grade national exam is one of the most valued exams by the society, students and school community for it is used as an entrance exam to the college preparation class. Thus the focus is more on acquainting students with mastery of the theoretical part of the lessons since the examination questions are all objective types which demands mere memory of the theoretical aspects of the lessons.

Again in the later sections, all the above listed reasons and other determinant factors that have a huge impact on what is going on in the classroom teaching and learning process as well as how teachers do the teaching with regards to environmental education ***in*** the environment are analysed on the bases of the qualitative data gathered from various key informants of this study.

[5] *The Ethiopian General Secondary Education Certificate Examination (**EGSECE**) – It is national examination in which students sit at the end of 10$^{th}$ grade. Students, on the bases of their exam result, will be streamlined into Academic (College preparation) and Vocational and Technical schools. Those going into academic fields are expected to sit for college entrance examination after two years of preparation and the others will either join the labor market or be self employed.*

### 5.2.4 Environmental education *for* the environment

Teachers and students were asked whether or not teachers do the teaching beyond lecturing what is presented with in the text book; whether or not there is skill based session as supportive of the theory based teaching and learning process? One of the biology teachers from the same school said the following:

> *There are numerous problems in our area in relation to pollution, water contamination, poor waste disposal and disease that come as consequences of these, but except giving some advices to my students of what to do and what not to do, I did nothing to give them detailed knowledge about the problems and practical skills and precautious measures that help them alleviate these problems. But, to your surprise, last year one student brought a biogas which he made at home. There are students who are active and interested on such things, but I do not even give them group project work. The problem is partly mine. I am mostly occupied in trying to cover the huge content in the syllabus* (A-BT2, - 01/2012.).

Below is also a quote which I selected it from many similar responses of teachers assuming that it gives a summary of the whole scenario with regards to environmental education *for* the environment. One of the interviewee teachers replied,

> *Here is the very deep rooted problem of our country concerning the teaching and learning process which is entirely lecture based, teacher dominated, theory oriented, and impractical. So, does environmental education in which we are engaged solely in giving information. In fact, teachers have various reasons (Like class size, teaching load, insufficient training, etc.) not to do it the other way- skill based (A-T1 -01/2012).*

As indicated in Scott & Outlon (1999), environmental education *for* the environment is a byproduct of 'technical,' 'practical' and 'anticipatory' forms of environmental knowledge – which, in other words, comes a result of the practice of environmental education *about* and *in* the environment. In a situation where the two important ingredients are less fulfilled or non-existent, environmental education *for* the environment is less likely to happen there at School A. The responses I got during teachers' interviews and students' focus group discussions indicate that students are learning very little *about* their local environmental realities and problems. Field trips/work, an exposure to laboratory exercises, real life experiences and practical learning through interactions and observations with the local biophysical environment are non-existent. Thus, the study in general found that environmental education *about, in* and *for* the local environment is not being practiced which left students to remain passive participants in their own environmental problems and concerns.

## 5.3 School B

### 5.3.1 Learning Environment

As described in the previous chapter (p.49), School B is found in a city surrounded by about seven lakes which is relatively more close to nature and rural oriented kind of city as compared to where School A is situated. The physical setting of this school is quite different from School A in many aspects such as: the size of the school compound, the vegetations around the school and the nearby physical and social surrounding. School B is built in huge area where the spaces left other than the physical buildings of the school is wide enough for various curricular and co-curricular activities which are going on in the school. Because School B is located a bit far away from a motorway and business activity areas, the school is relatively quieter and more conducive for teaching and learning process than the other school. The inside school compound as well as the outside physical environment is covered by forests of various trees.

What seems nice about School B, as a result of the above favorable physical situation, is that all the list of problems and shortcomings mentioned by teachers, students and school leaderships of School A are not any more problems in this school. As witnessed through unstructured observations, there are model learning sites built within the school compound by teachers and students, such as compost digester, botanical garden, beautifully planted trees in the entire school compound and various extra-curricular centers. As opposed to students in the other school, Students in School B are well kept from external disturbing pressures (like 'khat bets,' local bars, and video game cafes). Students' and teachers' concerns are about environmental problems that affect the agricultural activities and health of local community

For instance, students seem worried more about the manner in which the local people cut trees recklessly for personal fuel consumption and construction demands. Lack of awareness among the local community to protect the surrounding lake from various forms of contamination and pollution was also another concern raised by all participant students, teachers and school leaderships. Shortage of enough grazing lands, rainfall variability, soil erosion, water pollution and land degradation are some among the short listed local environmental problems mentioned through students' questionnaire as well as during the group discussions

With this background, let us see what is going on in the teaching and learning process in this school mainly with regards to environmental education *about*, *in* and *for* the local environment. Whether or not the biophysical and social environments of this school impacted and help environment related lesson being given in class as well as to what extent the locally based environmental problems are included in the teaching and learning process and how far the local environment is being used as a source for environmental learning.

### 5.3.2 Environmental Education *about* the environment

Despite the various differences between the two schools in terms of the physical and social setting as well as problems in connection to each locality, the data collected from School B also proofed that students are learning very little about their local environments though the reasons mentioned by School B teachers and school leadership are different from that of School A. Many of the local environmental problems and concerns listed above are hardly appeared as the subject of class room lessons. Many of the focus group students share the same comments that teachers are less committed to teach them about their local environmental realities. One of the students said:

> *They just teach us only what is presented in the text book. Some teachers are totally teaching only lessons of the text book, but still there are a few teachers who try to teach us about our local environment issues (B-S2, -02/2012).*

The school principal was also asked to comment on what he uses to observe about the role of subject teachers in teaching students *about* the local environment and he said:

> *The national broadcasted Plasma television[6] lesson is one of the very confining factors that limited teachers to stick to teach only what is presented in the syllabus. So, teachers are not teaching and giving important knowledge about the local environment to students (School leadership, 01/2012).*

Similarly, one of the biology teachers in the school share the idea that Plasma television lesson is one of the determining factors which tide teachers only to teach lessons that are presented during the plasma lesson periods and lesson from the text book

> *I personally teach more theory, but I share my own practical experiences in relation to the day's lessons. I think the plasma lesson is a unifying instrument which dictates our teachings. You cannot talk of lessons out of the issue discussed during the plasma class.(B-T 1, -01/2012)*

[6] ***Plasma Lesson****: refers to plasma television teaching which is being broadcasted from the central station to all over the country. Subjects such as Biology, Geography, chemistry, physic and other science subjects have plasma television teaching programs some days a week. During plasma lessons, live teacher (classroom teacher) has very short time before and after the plasma lesson to go in detail about the lesson of the day.*

It could have been possible to bring as more quotes as possible from interviews and focus group discussions on the given issue, but since all of the participants share similar comment that students are not learning *about* their local environments, only the above quotes are taken with the assumption that they represent the perception of all concerning environmental education *about* the local environment.

### 5.3.3 Environmental Education *in* the environment

Not all the lessons included in students' text books are totally unrelated to the local environments. There are, in fact, some topics and sup-topics which can be discussed with practical examples from the surrounding physical environmental contexts, such as lakes, rivers, forests, soil erosion and land degradation. Despite having these natural resources in the nearby surroundings, the practice of teaching environmental lessons using the physical environment as a medium of learning and teaching process is less evident. Many of the students confirmed that their learning is confined only within classroom learning process. One of the students, during the group discussion, gave the following typical example to describe the scenario:

> *When we have even topics about fishery, teachers do not take us to the nearby lakes to show us what it means by fishery in real life. They just simply tell us everything in the classroom without any practical examples from our locality (B-S3, - 02/2012).*

On the other hand, believing the importance of creating practical exposure to students as additional to what is being taught in class, one of the geography teachers told what he is actually doing and why he is not doing as he is supposed to do?

> *I do bring some local environmental issues in my class room teaching, but I do not show them practically. Due to financial and time constraints, I never took students for field trip and practical observation outside the school compound. (B-T2, 01/2012)*

Similar to students' comments, the school principal also argued that teachers' lack of commitment is the source of the problem. He said:

> *Those biology and geography teachers are telling their students only the theoretical and abstract forms of the lessons without creating practical exposure to students from which they can better grasp what they are taught in class. Look, teachers are not willing to take students even in the nearby potential practical learning sites. For instance, there are many lakes, rivers and factories in the surrounding area from which some are found in a walking distance, but no one dare to go there* (Leadership of School B, 01/2012).

As scholars argue, exposing learners to direct real world experiences can have stronger positive effect on the development of pro-environmental behavior than teaching students merely about the knowledge aspects of the biophysical and social environment (Kollmuss & Agyman, 2002).

### 5.3.4 Environmental Education *for* the environment

Thus, as I learnt from the entire field period, it seems that School B also has a long way to go to achieve a kind of environmental education and teaching and learning process which is meant *for* the environment. As shown in the various pro-environmental behaviour models discussed in theory chapter, the development of pro-environmental behavior is dependent on various variables among which knowledge and attitude are the common core variables that appear in different pro-environmental behaviour models (Kollmuss & Agyman, 2002). Nevertheless, students are being taught very little *about* their local environments without engaging them to locally relevant practical skills. Thus, given the situation where environmental education *about* and *in* the local environment is less practiced, it is unlikely for the present environmental education to acquaint learners with the knowledge and skills appropriate *for* the local environment. With reference to Walker (1997), it is the 'action component' of environmental education that makes it '*for* the environment' and different from 'other curriculum areas.'

Although she is unsure whether the school is doing things in the right way, one of the biology teachers in School B explained the possibilities of the school to contribute a lot to change the local community through the change in students' behavior. She explained:

> *Students are our messengers to the community. For instance, there are close to 3000 students only in grade 9 and 10 classes and if we- teachers - are able to change students properly, we can bring a lot of positive behavioral changes within the local community through students' knowledge building and skills relevant to the local environmental needs. But I do not think we are doing that right now for various factors. (B-T1,-01/2012).*

To sum up, as it is witnessed in the above sections, the school community particularly teachers in both schools are doing very little to acquaint learners with the necessary local environmental knowledge and relevant skills which could help students to develop positive attitude and pro-environmental behavior. Despite the relative differences of the two schools particularly in the biophysical and social contexts where in they are located, there are so many issues in common which students, teachers and school leaderships of both schools explained

and shared as intervening factors of environmental education *about, in* and *for* the local environment.

As witnessed from various participants of the study, plasma lessons, national exam, and centrally designed syllabus can be mentioned as some of the factors that put un-enabling situation for teachers not to make environment related teachings with local flavor. In the following sections, these and so many other determinant factors that affect the effective instruction of environmental education *about, in* and *for* the environment are analyzed based on the qualitative evidences collected through students focus group discussions and interviews with various subject teachers, school leaderships and educational experts.

## 5.4 Factors influencing the education *about, in* and *for* the environment

### 5.4.1 Class Size

*"Larger classes- less education"* Anita *Getzler*

Teacher-students ratio is considered as one of the key factors to provide quality education across all levels of schooling. Time given to individual and grouped students, time spend for instruction and non-instructional tasks by a teacher, time spend to follow up students' assignments, evaluating exams and other activities, etc. are all determined by the number of students assigned in a class. Obviously, the more the number of students the less instructional and individual time a teacher has to assist each student. In connection to this, one of the interviewee teachers described the situation as,

> *In a situation where you have up to 400 students in total with class size of 60 to 70, it is unrealistic to have a room for orienting the teaching and learning process more skill based with practical applications of what students are learned in classroom although environment related lessons believed to be conducted in more practical way. Mostly my instruction time is spent on lecturing for I cannot create an interactive learning due to large class of between 60 to 70 students crammed in a single class* (A-T1, - 01/2012).

As indicated above and as I witnessed during my observations, the situation is similar in both schools. The teacher–student ratio and the number of students attend per class is so large that it causes additional pressure for teachers to stick solely on teacher-dominated and lecturing way of teaching. One of those biology teachers described how the class size issue matter on what teachers do in class.

*Teaching about environment is beyond telling facts, we need to create citizens who can feel responsible for own actions. But it is less likely to create such people in our school while you have large group of students. The gap between knowledge and real life practice is something caused by population size which left teachers with one option- to feed student of all the facts, theories and information without engaging them with any practical activities or real life experience. So, students know very well about which of which practice is good or bad for the environment, but they do not have a lived experience of it so that they remained with their malpractices* (B-T3,-01/2012).

Due to the impact of increasing enrolment in primary education as result of EFA and MDG goals, the demand and enrolments of post primary education is also increasing. Consequently, shortage of classrooms and well qualified teachers become apparent reasons for the problem of large class size which is seen as one of the top listed challenges across all secondary schools in Ethiopia. According to UNESCO annual report in 2007, the pupil-teacher ratio in the case of Ethiopian secondary schools is 71:1- which is considered large.

### 5.4.2 Teaching loads

Various factors can be mentioned under learning environments though some of them seem to overlap each other and may appear as cause and effect manner. Teaching load is found one among many possible variables which dictate the way teachers handle the teaching and learning process; the assessment technique used and the manner they treat the subject matter. As learned during the interviews, the average teaching loads that each teacher executes per week in both schools range from 25 to 30 periods. This reduces teacher time devoted after class teaching duties - which implies teacher have less time to organize and run out of class activities, evaluate students' assignments every time (300-400 students per teacher) and carryout extracurricular activities.

Many of the teachers said sadly that although they believe that environmental education need some extra practical activities that provide students the exposure to learn by doing, the actual working situations such as high teaching load, large class size, lack of support from the school administration and the MOE are not inviting to do so. During the interviews, teachers from both schools emphasised that the high teaching load that every teacher has every week prevent teachers from running extracurricular activities which could have potentially helped students to thoroughly understand and internalize lessons taught in class. Besides, they added, teachers participation and contribution in after class activities and duties remain very little and insignificant. Mobilising the school community in connection to local environmental

problems would have been one of the likely tasks that teacher could involve themselves given that they have enough time other than their class time

### 5.4.3 Syllabus

Text books which teachers use as syllabus of the subject they teach are uniform across the country. All secondary schools, be it government, public or private, use the same syllabus prepared centrally by ministry of education. As learnt from responses of interviewee teachers, the syllabuses are nationally prepared that there is little room left for the teacher to take lessons from the local environmental problems. Some of the environmental issues in the text are very global, some are national, and a few others are not an immediate concern to the local society.

This is not actually the case of primary schools in Ethiopia where the curriculum design and development tasks are left for regional states and their respective educational offices. Each regional state has the full mandate to prepare syllabuses with its own language as medium of instruction and content which are pertinent to the regional realities. However, beginning from secondary school, everything with regard to curriculum design, syllabus preparation and other related issues are being done at central federal government level and then goes to regions only for implementations. On the other hand, Ethiopia is a country having very diverse social, economic, ethnicity, geographical and climatic zones and the extent and types of environment related concerns and problems vary from place to place. For instance, in geographic terms, there are places which exceed an altitude of 4000 meters above sea level with extreme cold weather especially in the mountainous regions of the country. On the other hand, one could find an area which goes down 200 meters below sea level (for example, Dallol region) which is believed to be the hottest place on earth. The same pattern applies to the population distribution across different areas where some places are densely populated while others are very scarcely populated. People's ways and means of life across different areas are also quite diverse in type and manner- from rain-fed subsistence to sole animal husbandry (More than 85 % of the entire population live in the rural area in which agriculture is the main source of livelihood). The remaining 15 to 20% of the population is inhabited in cities and towns with quite different way of life and challenges. Consequently, as teachers underlined, the needs and the problems in relation to the environment and other social and economic aspects are so

diverse that it makes it difficult to manage such issues within a single syllabus that is meant to be used across the entire country.

Moreover , teachers have also explained that teachers are neither participants in the process of curriculum design and syllabus preparation nor being given any orientation as to how they handle new text books which changes every time. Thus, teachers are doing their duties to the extent that they understand the text book. In here, it is important to mention what the curriculum design and development expert from the Ministry of Education said about the failure of their office for not giving introduction training for teachers while new text books are introduced. He said,

> *We have integrated enough environment related topics within the syllabus across different subjects, but the problem is we have neither prepared teachers' guide and supplementary resources nor given appropriate orientation for teachers as to how they handle new text books which almost get revised every time.* (Curriculum & Syllabus developer from MOE, 02/2012).

The curriculum expert from MOE suggested that given the fact that the country's poor economy may not allow an easy way to prepare different syllabus for different regions, to provide all the necessary in-service training for teachers help to minimize the gap. Besides, he added that creating the situation in which teachers participate in curriculum design and syllabus development process as well as supplying supplementary materials like teacher's guide for teachers would alleviate the problems to certain level.

### 5.4.4 Teachers

There are various issues presented in the previous sections of this chapter that are connected to factors that one way or the other affect teachers efficiency and roles as to how they teach environmental education as compared to how they ought to do it. Figure 5.1 presents a list of some selected words and phrases which are indicated by participant teachers, school leadership and students in relation to teachers' factors.

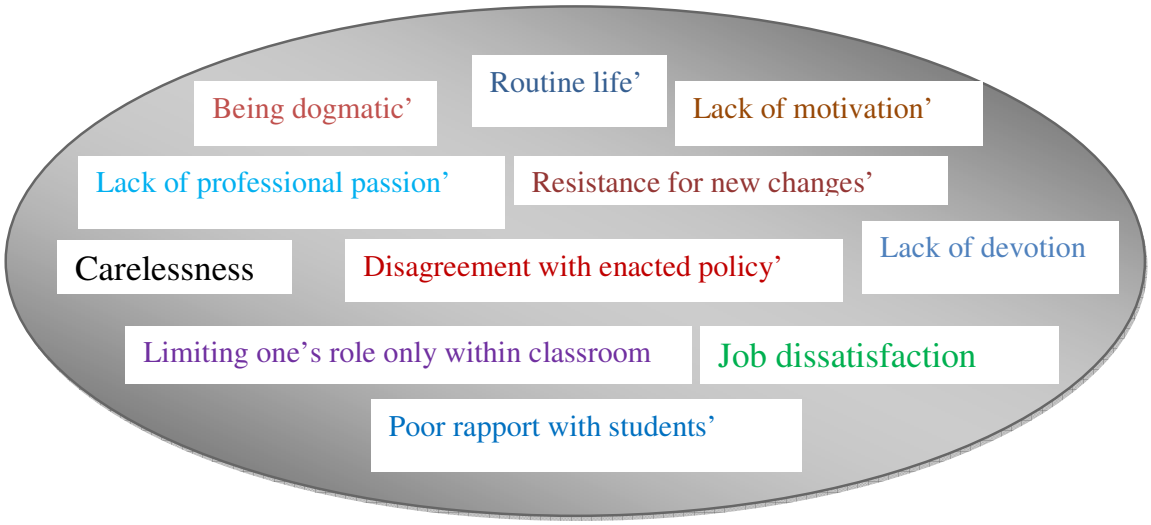


**Figure 5.1** Teachers' related factors

These are some of the phrases and terms mentioned by the teacher themselves, school leaderships and students as weaknesses and problems observed from teachers' side. To begin with some instances of self-critics among those individually interviewed School A teachers, one said,

> *We go all the time in the same way we used to do. Lack of commitment to contribute better under all the limitations we are in is one problem observed in teachers. It seems a common culture held by most teachers to mention resource scarcity and other related shortcomings as an excuse for inefficiency which is the commonly way of excusing oneself for inefficiency (A-T1 – 01/2012)*

To add some more flavour from what were heard from the students' side, here are two examples of students' responses with regards to the situations of teachers in relation to the teaching and learning process.

**Question**: *How do you describe the roles of teachers to help students have local environmental knowledge and develop important environment related skills?*

**Responses**:

> *The focus of the teachers is the reputation of the school as to how much students can pass the national exam, not about how to make us good students or citizens. The manner in which teachers try to maintain the classroom discipline is one source of poor relationship between students and teachers. If you are not academically potential and active student in class, by default, you are undisciplined and unimportant (B- S8, -01/2012).*

> *Teachers mostly do not create a class room situation where in we can have discussion and debate over some of the important issues and problems that matter for our locality. Besides, teachers do not give equal attention to everyone's ideas and questions. It seems that 'academic performance' is the only and the last option and way of life, the sole instrument measuring the quality of a*

*student. This is the situation we are in with regard to the way teachers view us. Then how would you expect students to take active role in environment and other serious local societal issues while the community as well as your teachers does not value your role. (A-S6, -01/2012)*

During teachers interviews, similar question were asked and one of the teachers said,

*We, teachers, don't give (create a chance) for students to think, to research, to question about their local realities, about their local problems, about their culture, etc. Sometimes, when I ask students to write a kind of report about local environment related problems, they come up with well researched report which goes beyond my expectation (B-T2, -01/2012).*

One directional way of teaching still seems the dominant method of teaching at least in the case of the two sampled schools within which teachers remain the sole sources of knowledge and students are passive recipients of knowledge without having enough exposure to exercise and test their own thoughts in various issues. The dynamics of classrooms - as composition of diverse students in terms of interest, ability, behaviour, and other aspects - have given little room in the process of shaping the teaching and learning process as well as the manner in which teachers handle classroom diversity. Teachers are portrayed as distant people for the majority of students and close for a few students in the same classroom. One of the students described in the following way as to how students are being 'stigmatized' as a result of differences in academic performances.

*Mostly when there is a special program that requires the participation of some students from the class, teachers call only students whose academic rank is within the first 5 to 10. The rest of the class left without being given even a single chance of being selected. This is truly unfair for it is not only exams that describe the whole personality issue of each individual. For instance, there are students who are very good in other activities such as in technical skills, in arts, in sport, etc. But only academic skill weight in every issue. This must be improved; students need to be seen with equal respect no matter how they are good or bad in their academic performances. (A-S4,-01/2012).*

To give a comparative view from teachers' side, one of the biology teacher from School A stated how she chooses and select some students while she prepare a kind of field trip from the large group of students she teach:

*Due to large number of students I teach which is unmanageable to take them all for field trip, I need to select only some of the students from each class room who are academically competent. For instance, last year, because I had no choice since my students are huge in number, I deliberately chose only those high ranked students from seven classes and went for field work. (A-T2, 01/2012)*

As many of the recorded interviews and focus group discussions tell, teachers are accused by students and school leaderships of being careless, unfriendly, less committed, less respectful to students, and discriminating. On the other hand, teachers blame the government and experts in the MOE for ignoring them to participate during curriculum design and development

process. But, a few teachers confessed that they have their own professional and personal weaknesses as to the problem raised particularly in relation to failure to teach students more practically about their local environmental issues.

### 5.4.5 Lack of initiatives

All the way through students' focus group discussions and teachers' interviews, it has been, one way or the other, mentioned that people always expect someone, or some specifically assigned authority or government delegate to come in and take all the initiatives in order to do tasks especially with regard to environment. There is a tendency of waiting for somebody to do it or it is considered as an 'assigned task' for somebody to do it. Teachers, students, school leaderships and others seem waiting for someone to take action or to push and tell them what to do rather than taking own initiative to move forward. It has been pointed out that teachers seem stuck in doing solely the daily teaching routine without having attention to other extra in and out of school expected duties. In this regards, students argued that they cannot call a single individual from the school as well as from the local community that can be exemplified as model in maintaining, protecting and conserving the local environment.

In a similar story, the school leadership of School B argued that people pro-environmental actions remain sustainable so long as their original involvements with similar action were not on the bases of certain kind of incentives (Though his comment seems contrary to the view that 'incentives for pro-environmental behaviour' is one of variables that make people to develop pro-environmental behaviour'- as it is indicated in the Sociological model of pro-environmental behaviour (Kollmuss & Agyman, 2002). To back his argument with practical example, he explained the case about the school's climate change club.

> *Look, we established climate change club only because we like to have it functional in our school. Then we went into British council and got some kind of project fund. Now the project has phased out, but we are able to sustain what we used to do because we have not been working from the very beginning just to get some personal benefit out of what we do under the club. Self initiation is extremely important on such kind of things which demands peoples' voluntary participations* (Leadership of School B,- 01/2012).

In this regards, while the researcher asked students whether or not each one of them have a belief of bringing about some kind of attitude changes within their family or local community, many of them said that most people expect some benefits or incentives even if you are helping them to do something important for their own lives. The variable 'incentives for pro-

environmental behaviour' comes here again as a factor to make people act pro-environmentally. Lack of self-induced initiative from all parties of the society (students, teachers, parents, etc) seems one possible potential factor which kept people remaining passive on their own serious local environmental problems. With reference to 'Altrusim, Empathy, and pro-social behaviour model as discussed by Kollmuss & Agyman (2002), lack of self-induced initiatives could be associated with lack of 'social orientation,' 'egoistic orientation' and' biospheric orientation'- which refers to lack of concern to avoid the 'suffering' of *other people*; to eliminate harm from *oneself* and to prevent the *'non-human' world* from destruction respectively.

## 5.5 Other Factors

What is going on outside the school compound within the nearby local community is also equally important for things we do in school. Family is the other form of school through which children nurtured into some kind of personality through parents' guidance and cultural orientations. The contribution of the local community is also important in influencing and shaping children's behaviour and total personality. With regards to students' behaviour and participation in relation to protecting and conserving their local environment, interviewee teachers were asked if there are possible factors which affect what teachers do in school with regards to environment related lessons. Here are some of the major out of school problems that are stated by teachers, students and school leaderships of both schools for having significant impact on what is going on inside classrooms as well as on students' environment related behaviour.

### 5.5.1 Students' family background

There are various views raised during teachers and students individual and group interviews with regards to students' family background. One is the needs and expectations of parents towards schooling as well as idea of schooling owned by many of students' parents. The other is the perceptions of parents towards their children are a few among the various factors that reshape what is being done in schools as opposed to what has to be done.

The first view, which was repeatedly raised during the discussions I had with teachers of both schools, is about how the demands of the parents and their 'thought' and expectations of schooling to their children dictate what to focus and do to satisfy the needs of the parents.

Parents' expectations of what the school is expected to do for their children is purely academic achievements that can be measured in terms of its future prospect (for instance, preparing students well for the national exam and thereby qualify them for college and university admission). Teachers explained that parents are not happy to see their children involved in other external (out of school) activities like the case of environment related out of school activities. One of the teachers said,

> *For instance, sometimes, we organize a kind of out of school activity like taking students outside the school compound into the nearby community to let them observe the physical and human local environmental problems, thereby to engage them in some kind cleaning activity in order to encourage the local community to clean their surroundings, to conserve and protect their environment. But, most parents are not happy to see that although there are still a few parents who give credit on what the school does in this regards (A-T1,- 01/2012).*

As the researcher asked homeroom teachers[7] and school principal about the educational status of students' parents, they replied that the majority of the parents are less educated (just only literacy and numeracy) or have no education at all which resulted in limited parental involvement in the children's education as well as others community related missions of the school (A-T3,-01/2012). Thus, the school cannot create common community vision regarding how the local community needs to work out in order to keep the physical[8] and social[9] environment clean, healthy and conducive to live in. As a result, schools tasks and duties remain limited within the school compound merely on academic matters.

If we have a look at the demographic nature of students' parent in terms of educational status, the data collected through students' questionnaire indicate that majority of parents are not well educated or not educated at all. For instance, in the case of School B, 18 students out of the 27 students responded that their fathers are farmers and not educated at all. The remaining 6 students responded that their fathers are government employee (which indicated these people have at least some education regardless of the level), and the last 2 students replied that their father has private business. Similarly, the educational status of students' mothers

[7] **Homeroom teacher**: A teacher assigned to follow up students who are assigned in the same classroom. A teacher is in charge of taking regular attendance and keeping students' individual academic records. He/she also serve as a student's parent contact person, etc.

[8] **Physical Environment:** - consists of physical features that occur naturally- *Four major components*: water (river, sea, and ocean), natural vegetation, Landform and rocks, weather and climate. *Natural resources* are for e*xamples*: rivers, seas , ocean, mountains, rocks, volcanoes, tornadoes

[9] **Social environment**: **social context**, **socio-cultural context**, or **milieu**, refers to the immediate physical and social setting in which people live or in which something happens or develops. It includes the culture that the individual was educated or lives in, and the people and institutions with whom they interact.

also showed that majority are 'farmers' (16 out of 27), some replied as 'housewife' (7 out of 27) and 3 of them said 'government employee.'

Similar case is also recorded in the case of School A students' family background where majority of students' parents are less educated specially many of the mothers are house wives with very limited educational experiences. Parents' education is not entirely a determining factors behind students' behaviour, but teachers reported that the situation make it difficult for the school to have common and shared mission regarding local environmental and other important issues.

The second view as students pointed out in the group discussions is the misconceptions of parents and the community at large have towards students' knowledge and their roles in their family and their community. One of the students said,

> *Even our parents do not value our knowledge; they do not give any credit to positive roles we could possibly play for the wellbeing of the environment and the community. Because our parents are older than us that they think they know better than us. As a result, such mentality excludes us from any decision make at home in everyday life. Then, we easily become careless on what we do and less active participants in common local community issues, like environment (A-S7, 01/2012).*

Another student in School B also said the following about parents,

> *You know our parents are uneducated farmers and they have no idea what we learn in school. What we learn in school is theory and we do not how to show what we learn practically to parents. Therefore, we do not communicate with our parents. Our parents always give attention to what they are being told by the local kebele (village level) administration rather than what we tell them (B-S12, 01/2012).*

Similar accusation is also raised against teachers for having neither positive nor negative perception towards students' societal value and positive roles for the community. Another group discussant described the attitude of teachers in the following terms,

> *The manner teachers handle students; the way they teach and the reactions they show during the teaching and learning process tell that they do not value the input that come out from students. This, one way or the other, has an adverse effect on our behavior.( A-S9,- 01/2012).*

Thus, all the needs and thoughts of schooling and perceptions about students' roles and responsibilities together with low educational status of many of the students' parents created learning environment which is merely academic. This situation makes the whole teaching and learning process to be detached from the physical and social environmental realities of the local context which reduced out of school community contributions resulted from schooling.

### 5.5.2 The Dichotomy between lessons learned and the local community life

One of the questions during focus group discussions of teachers and students was *about* the gap between students' knowledge of the environment and their action. In most cases, students have at least the basic knowledge about environmental problems and about how human action destroys the healthy nature of the environment. But students still do wrong things in the environment, such as cutting trees, throwing used materials everywhere, keeping their home and school unclean, and damping wastes carelessly everywhere and other similar environmentally undesirable habits. The possible reasons, as many of the consulted teachers as well as students raised during the interviews, are lack of awareness among many of the community members with regards to environment, the perception of the local community that undermine students' potential roles for protecting the environment and the loose coordination seen between the school and the local community regarding issues like environment. Due to this, students remained passive participants and actors in the whole process of solving local environmental problems. In this regards, teachers expressed their doubt about the possible mismatch between what is being taught in school and what students' parents in particular and the local community at large act in relation to environment. This is mainly because students - although they know the basics *about* environment - still do not act *for* the environment. In connection to this, one of the teachers said the following:

> *We teach students about environment in school, but students are still act wrongly and irresponsibly to the environment. This could be due to the mismatch between what schools teach and how and what the local community, including students parents, do with regard to environment. So, students neither change the community on the bases of the school knowledge nor they act responsibly on the bases of the lesson they acquired in school (A-T3, 01/2012).*

Thus, teachers conclude that unless there is some kind of harmony or uniformity between what we teach in school and what the community consciously or unconsciously act in everyday interaction, all the efforts paid by the school community may not bring any meaningful results in community favourable change in terms of environmental behaviour.

### 5.5.3 Relationship between stakeholders

There are various concerned actors such as the Federal Environment Protection Authority (EPA), Addis Ababa Environment Protection Authority (AAEPA), the Ministry of Education and many other local and international NGOs which are one way or the other involved in

environment education. It seems that all share the same goal of creating environmentally responsible citizens through education despite weak collaboration to work in coordination. The Ethiopian Environment Protection Authority- which has regional offices and branch offices structured down the local kebele[10]level - is mainly responsible for policy making, formulating standards, capacity building and researches (UN-HABITAT, 2008). The Ministry of Education is directly connected to schools in the process of designing and developing environment inclusive curriculum across all levels of schooling. There are various non-governmental organizations whose activities are connected to the environment. Many of the teachers explained that there is government institutional set up that comes from the top federal level down to the local kebele level with regard to national environment protection and conservation mission. There are NGOs established having a mission of creating environmental awareness within the society; and there is the Ministry of Education that has a grand share and a say in what is going on in schools. However, the problem is that they all act individually; many of them do not involve teachers in the dialogue as to how the school needs to handle environmental issue in different forms such as through pure academic and through school club activities. One of the teachers who run the Environmental Club of the school said,

> *Except sending leaflets, brochures and model plans to the school environment club, the necessity of allocating environment budget seems ignored or left for the schools to find out their own sources to finance environment related activities (A-T4, -01/2012).*

Thus, the lack of coordination between different stakeholders at different levels; loose communication among all organizations who are dealing with environmental issues; and inability to see what is really important for schools in order to build their capacity so that they better contribute to the local community in various aspects.

### 5.5.4 Purpose of schooling

> *"To me, I am here five days a week, so many days a year is to live better life in the future."(A-S10,-01/2012)*

One of the responses of students while answering a question about why they are in school. Probably, the goal sought out of schooling by students, parents, teachers, school leadership and the state matter for the final outcome. The purpose of schooling for which millions keep in mind while heading to school every day throughout the year may determine who they

[10] Kebel: the smallest unit and lowest structure of a city or a town.

finally will be in many aspects. Probably, students, parents and the community's value orientation about schooling might be quite different from what it intended to be while the whole education system is designed by the state. Similar gap could be observed regarding the goals that teacher have in mind while doing their daily teaching.

At the end of each focus group discussion with students of both schools, the researcher asked the students to reflect on the purpose of schooling and the dreams they want to live or achieve through education. I selected and listed down some of them having the assumption that they may give a glimpse about the way they perceive education which interns may tell how they map out their actions as long as they are in school or how their action is dictated by the initial goals they set out.

**Question**: *What is education for you and why do you come to school? What do you want to achieve through education?*

**Responses:**

*To me, I am here five days a week, so many days a year is to live better life in the future (A-S1, 01/2012).*

*I learn only to score very good grade as much as I can and thereby to win life through education. (B- S4, -01/2012)*

*I learn first to myself, then to my parents and finally to my country. (A-S9,- 01/2012).*

*We learn just for getting better mark. (B-S2,- 01/2012)*

*I want to live a better life in the future, I want to help my parents who supported and paid everything to get me in school. Then I will help my country (A-S7,- 01/2012).*

*First I want to achieve my dream of living better life, and then serve my country professionally. Many Ethiopians leave their country in the name of getting better education having the dream of helping their home country back, but often they do not return back to their home land; rather they serve other people because they get better salary there than here. But, me, I will never do that, I will first serve my country (A-S3,- 01/2012).*

*I want to live better life than I live now. I want to help my parents and my country. Besides, I want to know what I don't know before (B-S6,- 01/2012).*

*I want to escape unemployment through education, thereby help myself and my parents.(B-S1, 01/2012).*

*I learn only to score very good grade which is a necessary condition for university admission. (A-S5, 01/2012).*

As seen from these answers, no student responded anything that might connect to environmental education and concerning about climate change and other related issues. Even

though they all know why I was there, no reflection on education *about, in* and *for* the environment was observed.

## 5.6 Concluding Remark

> *No one in everyday world gets paid for memorizing facts and taking exams. Most people get paid for solving problems. Content, the coin of the educational realm, is relatively meaningless outside the context of the problem.* (Jonassen, 2004:2)

In this chapter, the findings of the study has been presented on the bases of the data which were collected using different qualitative data collection tools from students, subject teachers, school leaderships and environment club leaders of the two schools as well as experts from the MOE. The local environment, as a focal point of the whole research process, was the core issue within which the whole research questions were trying to address it as curriculum (contents to be taught), pedagogy and evaluation (in terms of behavioral outcomes).The interplay between what is going on inside classroom teaching and learning process and what is in the physical and social contexts of the schools. How far they are interlinked as far as environmental education *about, in* and *for* the environment is concerned, was also the main issue addressed in this finding chapter.

In general, the findings indicated that both school are not teaching students *about, in* and *for* the local environments. Teachers are not using the local environmental contexts as a source of learning as well as - as a subject of learning. Nevertheless what is more interesting was the various perspectives and views raised by different research participants in relation to the factors that affect the teaching of environmental education *about, in* and *for* the environment.

The discrepancy between views and perspectives of parents, students, teachers, school leaderships and curriculum experts over schooling, as reflected in the data, can tell that education for societal purposes like the case of education *for* environmental protection and conservation has a long way to go unless there is a way to narrow down the differences. Thus, as it shown in the previous sections of this chapter, environmental education *about, in* and *for* the local environment is influenced by the several factors including the possible understanding gap between different interest groups in education particularly in those fundamental questions on the purpose of schooling.

In the next chapter, a brief concluding summary of the finding is made in line with the theoretical framework of this study as well as the contextual scenario of the two sampled schools in terms of biophysical and social environments.

# 6 Conclusion and recommendations

## 6.1 Environmental education *about, in* and *for* the local Environment

This qualitative case study has examined the state of affairs of two schools with regards to environmental education *about, in* and *for* the environment with particular reference to the local environmental contexts. The main targets of this research are to see the contextual relevance (in terms of contents and pedagogy) of environment related secondary school lessons to the local environment; the extent in which environment and education are interlinked - given the fact that Ethiopia is one of the shortlisted drought prone and environmentally the most at risk countries in the world; and the determining factors that affect and dictate the practice of environmental education in connection with local environmental contexts.

Consequently, the guiding curriculum theory, environmental education theories, pedagogical alternatives, pro-environmental behavior models were reviewed in order to understand the scenario in line with the purposes and quest of the study. Accordingly, environmental education *about* the environment which refers to the knowledge aspects of it; environmental education *in* the environment implies to the practical experiences within the environment; and environmental education *for* the environment refers to the behavioral outcomes of it - are all deeply embedded under the three message systems of Bernstein (1979): curriculum, pedagogy and evaluation. All these again reveal as components of the different pro-environmental models which are discussed in the chapter 2.

On top of that, critical pedagogy of place and place attachment theory were also discussed as conceptual framework of this study in a sense that a pedagogy which critically consider the social and the ecological aspects of a place and a theory that deals with the meaning attached between people and the respective cognitive, affective and psychomotor aspects of their place, are both pertinent conceptual tools to analyze environmental education *about, in* and *for* the local environment. *About* the environment goes to the cognitive aspects of a place while *in* and *for* the environment are explained in the affective (e.g., attitude) domain of a place and the kinesthetic learning (relevant skills) of a place respectively.

Similarly, the goal of critical pedagogy of place is to help learners to critically examine, be aware and understand the social and ecological situations of their place, which in the process may lead learners to develop a new desire, motivation and responsibilities to rehabilitate, conserve and protect their local environments (Gruenewald, 2003; Manteaw ,2011). Thus, it gives sense to see and understand the findings of this study through these conceptual screens that connect environmental education with the concept of 'place'.

Accordingly, the finding of this study is explained in line with the above theoretical framework and discussed by taking the biophysical and the overall environmental contexts as a point of references. Figure 6.1 shows the comparative perspectives of what sampled students of the two schools thought about their local environmental problems and concerns. Within the light of this data, the core findings of the study are discussed in the following sections.

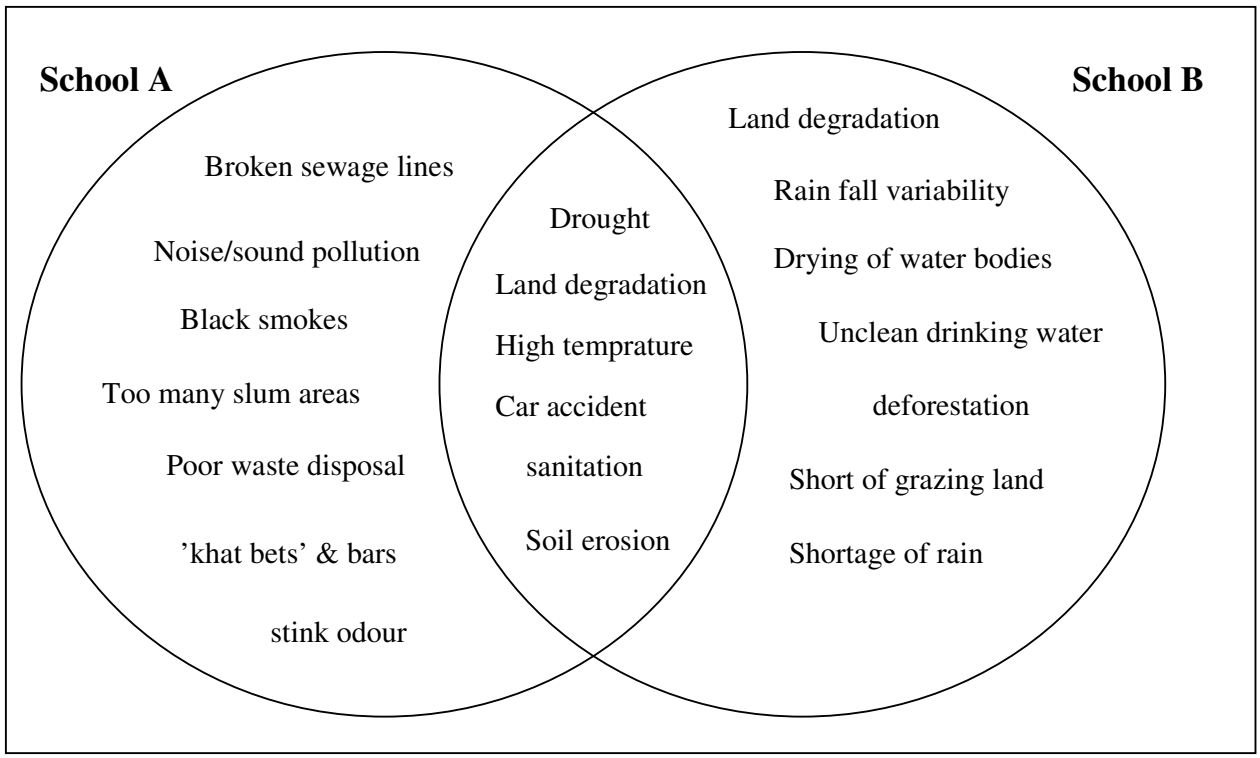


**Figure 6.1** Students perspectives on their local environment problems and concerns

As it is seen in Figure 6.1, the perspectives of students from School A and School B towards their local environmental problems and concerns are so different except a few cases seen in the intersection area where both groups listed similar environmental problems. What does this

difference implies to environmental education *about, in* and *for* the environment particularly to the local environmental realities? What does it really mean for an environmental education that ignore to dwell on those place- specific environmental problems and challenges students are facing? What are the pulling factors that detached environmental education from dealing with the actual local environmental contexts as evidenced in the finding of this study? A few key points on the implication the findings with these questions are discussed as conclusion.

## 6.2 Same curriculum, different problems, same input

The document review made on the 10th grade Biology, Geography and English syllabuses and responses from the students' questionnaire showed that there is substantial integration of environment related contents and topics incorporated within these three school subjects despite the fact that much of the contents included are more general, global and national environmental issues and problems. The implementation of the centrally designed same curriculum across every school in all corners of the country together with various limitations connected to teachers, over all learning environment, standardization and purposes of schooling (as thought by students, teachers, parents, and others) made the overall practice of environmental education *about, in* and *for* the environment to be detached from the actual local environmental contexts where in the two schools are situated.

Given this, as also experienced in the course of the field period, environmentally related problems and concerns peculiar to School A and School B defer (Figure, 6.1). However, students in the two schools are being taught uniformly in terms of the input (knowledge *about* environment) they are being provided, the pedagogy applied by teachers to provide the inputs, and the outcomes (expected behavioral changes) that sought at the end of environmental education instruction, while the real demand for knowledge and skills and the possible outcomes are contrastingly different between School A and School B.

The implication of such one size fit all environmental education practices regardless of considering the clear and visible differences unique to each contextual case is immense. For instance, in simple terms, the environmental education which is being given in these schools are not really helping students to be part of the solution while they are the ones who are being suffering from the various consequences of environment related problems apparent in their local area. Such environmental education practice is flawed from the outset for it does not acquaint learners with locally relevant knowledge and skills which are pre-requisites for pro-

environmental behaviors that are expected to be achieved at the end of environmental education instruction (Kollmuss & Agyman, 2002).

Environmental rehabilitation, conservation, protection and adaptation start from a clear understanding of the social and ecological situations of a particular place. The pro-environmental actions are also orchestrated on the bases of socio-ecological knowledge and contextual situation of a local place. Among various possible actors of change, the local communities, including students, are the immediate agents for the positive changes one sought to bring in a particular local place as far as environment-related problem solving is concerned. Accordingly, under the context of schooling, students need to have local environmental knowledge and locally relevant skills which together empower them to critically question the old malpractices that affect the environment and act pro-environmentally including changing the local community to in terms of awareness, attitude and behavior (Gruenewald, 2003).

Besides, as shown in figure 6.1, students of both schools have listed the environmental problems they know and observe in their locality and why they listed different problems while they are being taught the same curriculum through similar pedagogy to achieve same goals? As indicated in place attachment theory, people are emotionally attached to the place they inhabit and brought up. People's attachment to their place is also manifested through local cognition, attitude formation and some place-specific skills (Steven and Carol, 2007). As a consequence, students have already identified their specific local environmental problems regardless of what they are taught in school. However, while the role of environmental education need to nurture students' existing local cognition with scientific knowledge, real life experiences and experimentation, the existing practice of environmental education in the two schools seems to drive a wedge between students and their local biophysical and social environments. As Sobel (2004:5) criticizes, "Educational biodiversity falls prey to the bulldozers of standardization."

To sum up, connecting schools with the local community realities and biophysical environments is what it means by environmental education *about, in* and *for* the environment. Losing this connection is losing relevance in education and missing the environmental and societal purposes of schooling. The discrepancy found between the practices of environmental education and the real practical knowledge and skills demanded in each locality is a remark of the findings of this study.

Thus, on the bases of the findings, the following recommendations are drawn

## 6.3 Recommendations

Given the various shortcomings discussed all the way through the previous chapters with regards to environmental education *about, in* and *for* the environment; and understanding that many of the problems possibly be alleviated in parallel with economical developments of the country, still there is a lot of things that can be improved under the given limitations. Here are some of the ways forward to improve some part of the given environmental education scenario:

- ✓ Ethiopia, as one of the most environmentally at risk countries, a huge effort should be made to strengthening the relationship between education and environment. Thus, a wide range of rigorous researches should be conducted in the area to gain an in-depth understanding of the scenario at the national level.
- ✓ Teachers should be given enough and continuous in-service training as to how they handle issues that demand local adaptation and contextualization. Since many of the problems raised earlier with regards to factors of environmental education are highly interconnected with teachers' factors, the kind of in-service training and other forms of incentive mechanism may boost teachers' motivation to contribute a lot under the limitations.
- ✓ The various stakeholders who are acting on environmental issues and problems should try to create a common institutional network within which they mobilize resources (both technical and financial resources) in coordination to avoid overlapping and to do more meaningful and effective work towards environment protection and conservation through education.
- ✓ The baseline of environmental education *about, in* and *for* the environment should be the very local environmental issues, problems and concerns which further expand into the national specific environmental problems and global level environmental concerns.

To sum up, the dynamics of the responses and my finding in general could pose many questions on the education which could be further investigated. Keeping in mind that this study presents a situation regarding environmental education in only two selected schools, one cannot generalize. However, according to Patton (2002) one can learn a great deal and often open up new territory for research.

Given my finding in School A and School B and the scenario above, it would be very interesting to further research what it would take to ensure that learners experience being educated *about, in* and *for* the environment and *about, in* and *for* Ethiopia

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# 8 Appendixes

## 8.1 Appendix 1

### Interview guide for subject teachers of English, biology and geography

1. To what extent the subjects (education) you teach and environment are interconnected?
2. What is your opinion about what education has to be for the environment and how the current actual practice looks?
3. What is your view about the role of education (For instance, the subject you are teaching in grade ten) to help students have the knowledge about their local bio-physical environmental realities and problems and relevant skills that help them act responsibly?
4. Environment related contents presented in the school syllabus are more general; and issues included in each subject talks about national and global issues, not something specific to local realities. How do you adapt contents of the syllabus to fit in to the local contexts?
5. How often do you go out with your students to field, laboratories or any kind of learning sites other than the classroom in order to learn class room theoretical lessons practically
6. What are your challenges in relation to environmental lessons, particularly to teach students in a manner that enable them have the knowledge, skills and concerns about their local environmental issues?
7. Do you use discuss with your students how you together can play a positive role in your community in connection to local environmental problems?
8. Do you use to participate individually and in group with your students in any kind of community awareness creation activities in connection with environmental issues?
9. What do you think is missing between subject teachers, students, the school administrative, and ministry of education in order to address environmental issues through education at secondary school level?
10. Can you please brief me (if there is) what is being done by the school community (teachers, students and administrative bodies) with regard to the local environment problems?
11. Do you have anything to add in what we have discussed so far?

## 8.2 Appendix 2

## Group interview guide for students' focus group discussion'

1. What do you know about climate change and its possible impact on your country, on your local community and on your life?
2. Would you please tell me about some of environment related problems particular to your locality?
3. Whom do you think is responsible to the consequences of climate change? Where should come the possible solution to climate change? Who should do what? What is your role as a student in this regards?.
4. Would you please say something on what you think about your local environments and its related problems? You can list the problems you know about your local environment related problems.
5. To what extent the lessons of school subjects (English, geography and biology) you are being taught and local environment related concerns and issues are interconnected?
6. What have you learned about your local environment issues and problems from your schooling? From which subject and what?
7. What is your view about your roles and responsibilities to conserve and protect your local natural resources and to solve environment related problems of your locality? If so, can you say something you used to do in doing so?
8. What do you think teachers have to do in order to encourage students involve in environmental action of their local places?
9. Do you have any suggestion what the schools has to do with environment?
10. To what extent do you think that you can play a positive role to be part of the solutions with regard to your local environmental problems?
11. To what extent do you believe that your environmentally irresponsible actions can damage your local physical and human environment?
12. Can you say something about what you want to achieve through education?

## 8.3 Appendix 3

## Interview guide for the school leadership's interviews

### Themes

- ✓ The relationship between education and environment
- ✓ School leadership, education and local environment
- ✓ School leadership, teachers, students & local environmental problems
- ✓ Students, education and local environmental knowledge, skills and behavior
- ✓ Environmental education and the challenges

**Questions:**

1) What is your view about the relationship between education and environment? What do you think about the role of education for the local environment, for the local community and for climate change at large?
2) What is your belief about your leadership roles in relation to education, local environment and community?
3) There is prescribed national curriculum at the top that goes down to be implemented in the class room level. What is your role in between the nationally set curriculum and class room practice by subject teachers? How do you check out whether teachers are working according to what is prescribed by the ministry of education or not?
4) What is your view about the roles that school subject teachers should play to acquaint students with the knowledge and skills relevant to the local bio-physical and human environmental realities, problems and concerns? What is your contribution towards these issues?
5) What kinds of extracurricular activities are going on in the school? Which activities are interlinked with environment and the local community?
6) Have you ever discussed and worked out about how your school community including students and the staff can take a part to solve your local environmental problems?
**7)** Would you please list some of the serious environment related problems of your locality?
**8)** What are the challenges for your school to contribute to the local environmental problems?
9) Finally, what do you suggest schools have to do to enable students to be active participants in their local environmental problems and in those problems that affect their community?

## 8.4 Appendix 4

## Interview guide for environment club leaders

### Themes

- ✓ Duties, roles and functions of the club
- ✓ Activities of the club inside and outside (if any) of the school
- ✓ The interaction between the club activities and the main curricular activities
- ✓ The challenges of the club

## 8.5 Appendix 5

## Students' Questionnaire

### Section 1

#### 1.1 Background Information

**Sex** Male ☐ Female ☐ Age_____

#### 1.2 Family occupational status

| **Father's job** | **Mother's job** |
|---|---|
| -Business man ☐ | Business woman ☐ |
| -Farmer ☐ | Farmer ☐ |
| -Government Employee ☐ | Government Employee ☐ |
| - Specify if other occupation | Housewife ☐ |
| _____ | Specify if other occupation |
| | _____ |

### Section 2

1. What are your possible sources of information and knowledge in relation to environmental issues and problems? You can tick more than once.
   - ✓ Natural disasters or other environment related problems ☐
   - ✓ Media: radio, TV programs, newspapers, etc.) ☐
   - ✓ Books ☐
   - ✓ Parents ☐
   - ✓ Schools environmental club ☐
   - ✓ Education ( What you learn from class room) ☐
   - ✓ Experience with the natural world ☐
   - ✓ Organizations ☐
   - ✓ Friends and other individuals ☐
   - ✓ List if there are other sources:

     _____

     _____
2. Which of the following source is the most influential to give you the knowledge and information about your local community and environment related knowledge and experiences. You can tick more than once
   - ✓ Education☐

- ✓ Disasters or other environment related problems ☐
- ✓ Local media, like TV, radio, newspaper ☐
- ✓ Parents ☐
- ✓ Books ☐
- ✓ Organizations ☐
- ✓ Interacting with your local natural environment and with your community ☐
- ✓ Friends or other individuals ☐
- ✓ Local environment concerned offices(if there is around ) ☐
- ✓ Please specify any other sources if there are.

  _____

3. Would you please list down all what you know about environment related problems of your local places and your community?
   **For example**: sanitation problems,

   _____

4. Can you mention some of the most serious environment related problems of your country Ethiopia? Example: drought _____
   _____
5. Have you ever involved in any environment related activity in your local area? If your answer is yes, please answer the following questions.

   a) In what kind activity you have been involved?

   _____

   b) Where have you been involved?

   _____

   c) Which organization and institution organized the activity or the program? Is that through your school, NGOs or others? Please specify.

   _____

6) Finally, which of the following school subjects teach more about environmental issues, environmental protection and conservation? You can tick more than once.

English ☐ Chemistry ☐

Biology ☐ Physics ☐

Geography ☐ Civic and Ethical education ☐

Others_____

## 8.6 Appendix 6

**Note:** Afan Oromo[11] Language version of the questionnaire (This is the questionnaire which was used in School B where many of students' first language is Afan Oromo)

Barumsa naannoo (environment) waliin wal-qabatee armaan gaditti gaffileen dhiyaataniiru.Tokkoo tokkoo gaafilee xiyyeeffannoon erga dubbistee booda,filannoowwan yaada ykn amantaa koo naaf calqqissisa jettu tollo ykn sanaa ol filadhuu deebisi.Tokkoo tokkoo gaaffileetiif deebiin sirrii ykn dogoffora jedhamu hin jiru.Deebiin sirrii filannoo ati kun yaada koo naaf calaqqisiisa jettee filattudha.Maaloo hanga siif danda'ametti deebii sirrii deebisuuf yaali.Deebiin kee argannoo qorannichaaf murteessaa waan ta'eef,of-eeggannoofi sirriitti deebisuudhaan na gargaari.yaada dabalataa yoo qabaattes iddoo duwwaa gara dhummaa bargaaffii kanarratti barreessi.Deebiin ati kennitu martuu icciitiidhaan qabama.

Yeroo kee arsaa gootee bargaafficha guutuudhaan waan na gargarteef dursee sigalateeffachuuun fedha.

Abrahaam

Dagguu

**Kutaa duraa**
**Odeeffannoo seenduube (Background information)**

Koorniyaa Dhiira ☐ Dubara ☐

Umrii _____

Hojii ittiin bulmaata abbaafi haadhaa

| Abbaa | Haadha |
|---|---|
| - Daldalaa ☐ | - Daldaltuu ☐ |
| - Qonnaan bulaa ☐ | - Qonnaan bultuu ☐ |
| - Hojjetaa mootummaa ☐ | - Hojjetaa mootummaa ☐ |
| - Kan biro yoo jiraate iddoo duwwaa siif Kennamerratti ibsi | - Kan biro yoo jiraate iddoo duwwaa siif Kennamerratti ibsi |

[11] **Afan Oromo (Oromiffa**): This is the name of the language which is spoken by one of the big ethnic groups in Ethiopia called Oromo.

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Kutaa lammeessoo

1. Armaan gaditti odeeffannoowwan dimmootaafi rakkoolee nannoo ilaalchisuudhaan tattoo(gabatee) keessatti filannoowwan kennamaniiru.kanneen keessaa akka madda odeeffannootti kan si tajaajilu filannoo tokko ykn sanaa olirratti sarara xiqqaa(-) iddoo duwwaa siif kennamerratti barressi.Meddi odeeffannoo kee kanneen tarreefamaniin alatti yoo ta'e,iddoo duwaa gara dadiitti dhiifamerrati mallatticha kaa'i.

| Lakk | Filannowwan odeefannoon ittiin argamu | Mallattoo |
|---|---|---|
| 1 | Balaawwan umama ykn rakkoolee naanno waliin wal qabatan | |
| 2 | Meeshaalee sab qunnamtii | |
| | 2.1 Raadiyoo | |
| | 2.2 Televizyiinii | |
| | 2.3 Interneetii | |
| | 2.4 Galaalchaawwan (gaazexaawwan) | |
| | 2.5 kan biiroon yoo jiraatan ibsi (caqasi) | |
| | 2.6 Fiilmiiwwan | |
| | 2.6.1 Kan biyya keessaa | |
| | 2.6.2 Kan biyya alaa | |
| 3 | Kittabilee | |
| | 3.1 Kitaabilee barnootaa | |
| | 3.2 Asoosama ykn kitaabiilee barumsarraa adda kitaabota ta'an. | |
| 4 | Maatii | |
| 5 | Guumii naanoo kan mana barumsaa jiru | |
| 6 | Barumsa (barumsa mana barumsaatti kennamu) | |
| 7 | Muuxannoo uumama waliin qabdan. Kana jeechuun wantoota umama ta'an waliin hojiiwwan walitti sifidu yoo jiraateefi waa'ee naannoo beekuuf akka madda odeffannoo tokkoo ta'ee yoo sii tajaajile | |
| 8 | Jaarmiyaalee ykn dhaabbilee dhimma kunuunsa naannoo waliin wal qabatee | |
| 9 | Qabata dhiibbaa hiriyoota kee ykn namoota biro (nama fakeenya siif ta'e) | |
| 10 | Maddeen odeeffannoo armaan olitti tarreeffamaniin addatti yoo jiraate. | |

**Kutaa Sadeessoo**

Taattoowwan (gabateewwan) armaan gadii keessatti waa'ee haawaasa naanoo,dhimmootaafi rakkoolee uumamaa naannoo keerratti madden odeeffannoo dhiyaataniiru.Dhimmootaafi

rakkoolee naannoo waliin kan wal-qabate filannoo madda oddeeffannoo gaarii kan siif ta'e sarara xiqqaan (-) mul'isi.Filannoowwan tokkoo ol filachuun ni danda'ama.Maddeen oddeeffannoo gaditti tarreeffamaniin addati yoo qabaatte iddoo duwwaa gara gadiitti siif dhiifamerratti barreessii.

| Lakk | Waa'ee madda odeeffannoo | Sarara xiqqaa(-) |
|---|---|---|
| 1 | Barumsa daree keessaa | |
| 2 | Balaa uumamaa naannoorra ga'e ykn rakkolee naannoo waliin qabate | |
| 3 | Meeshaalee sab-qunnamtii naannootti argamurraa. | |
| | 3.1 Televiziyiinii | |
| | 3.2 Raadiiyoo | |
| | 3.3 Galaalchaa (Gaazeexaa) | |
| | 3.4 Fiilmiiwwan biyya keessaa | |
| | 3.5 Kanneen biiroos yoo jiraatan ibsi | |
| 4 | Maatii | |
| 5 | Kiitaabilee | |
| | 5.1 Kitaabilee barnootaa | |
| | 5.2 Kitaabilee asosamaa fi al-asoosamaa | |
| 6 | Dhaabbilee eegumsa naannoorratti hojjetan (dhimma naannoo waliin wal-qabate) | |
| 7 | Sochii uumama naannoo keettfi haawaasa keessa jirtu waliin taasisturra | |
| 8 | Hiriyoota keefi namoota biro (role model) | |
| 9 | Kanneen biro yoo jiraatan ibsi…….. | |

2. Naannoo fi haawaasaa keessa jiraatuuf keessatti rakkooleen umammaa fin am tolchee ta'anii kanneen nannoo (invaaromeent) waliin wal qabate kan beektu yoo jiraate tarreessi.

   Fkn.Hongee

_____
_____
_____
_____

3. Balaawwan uumammaas ta'e nam-tolchee naannoo waliin wal-qabanii itoophiyaa keessatti raawwatanii turan warra gududdoo barreessi.

_____
_____

_____
_____

4. Eegsumsa naannoorratti sochii taasistee beektaa?Yoo taasistee beekta ta’e gaafilee itti aananii dhiyaatan deebisi.
   A.Sochiilee akkamiirratti hirmaatte?
   _____
   _____
   B.Eessatti hirmaatte?
   _____
   _____
   C.Qaama ykn dhaabbata kamtu sagantaa eegamusa naanoo san qopheesse?
   - Mana barumsaadhaa?
   - Dhaabbilee mit-mootummaadhaa?
   - Moo kanneen biroodha?_____

6. Gosa barumsaa ati barattu keessaa kamtu eegumsa naannoo ykn naannoo ilaalchisee haala fooyyee qabuun barumsa dhiyeessa?

. Afaan ingilizee

. Baayolojii

. Hawaasa

. Fiiziksii

. Keemistirii

. Kan biroon yoo jiraate ibsi_____

## 8.7 Appendix 7

**Note:** Amharic[12] language version of the questionnaire (This version of questionnaire was used in School A in Addis Ababa where Amharic is the official language)

ከዚህ በታች ከኢንቫሮመንት ት/ት ጋር በተያያዘ ጥያቄዎች ቀርበዋል፡ ፡ እያንዳንዱን ጥያቄ በጥሞና ካነበብክ/ሽ በኃላ ያንተን/ችን ሀሣብ ወይም ዕምነት ያናፀባርቃል የምትለውን/ይውን አንድ ወይም ከዛ በላይ አማራጮች መካከል በመምረጥ መልስ ስጥ/ስጪ ፡ ለእያንዳንዱ ጥያቄ ትክክል ወይም ስህተት መልስ የለውም፡ ፡ የራሴን ሀሳብ ወይም ዕምነት ያንፀባርቃል የምትይው/ለው ምርጫ ነው ትክክለኛ መልሱ፡ ፡ እባክህን/ሽን ስትመልስ/ሺ በተቻለ መጠን ትክክለኛ መልስ ስጥ/ጪ ፡ ያንተ/ቺ መልስ ለምርምሩ ውጤት ወሳኝ ስለሆነ በጥንቃቄና በትክክል መልስ ለመስጠት ተባበር/ሪ፡ ፡

ተጨማሪ ሃሣብ ቢኖርህ/ሽ በመጠየቁ መጨረሻ ባለው ከፍት ቦታ ላይ ፃፍ/ፊ፡ ፡ የሚሰጠው መልስ በሚስጥር ይጠበቃል፡ ፡ በመጠይቁ ላይ ስም መፃ ፍ አያስፈልግም፡ ፡

ጊዜህን/ሽን ሰውተህ/ሽ መጠይቁን በመመላት ስለተባበርከን/ሽን አስቀድሜለ ማመስገን እወዳለሁ፡ ፡

አብርሃም ደጉ

**ከፍል አንድ**

**ዳራዊ መረጃ (background information)**

**ፆታ** **ወንድ** ☐ **ሴት** ☐

**እድሜ**……

**የአባት እና እናት ሙተዳደሪያ ሥራ**

| **አባት** | **እናት** |
|---|---|
| -ነጋዴ ☐ | -ነጋዴ ☐ |
| -ገበሬ ☐ | -ገበሬ ☐ |
| -የመንግስት ሠራተኛ ☐ | -የመንግስት ሠራተኛ ☐ |
| -ሌላ ካለ በከፍት ቦታውላይ ግለፅ/ጪ | -የቤት እመቤት ☐ |
| …… | -ሌላ ካለ በከፍት ቦታውላይ ግለፅ/ጪ |

[12] **Amharic:** *Amharic is a name derived from one of the large ethnic group called Amhara. Amharic is the name of the language which is one of the most widely spoken languages in Ethiopia. Amharic is also the official language of the country.*

**ክፍል ሁለት**

- ከዚህ በታች በሰንጠረዡ ውስጥ ሥለ ኢንቫይሮመንት ጉዳዮች እና ችግሮች በተመለከተ የመረጃ ማግኛ አማራጮች ተጠቅሰዋል፡፡ ከነዚህ ውስጥ ለአንተ/ለአንቺ የመረጃ ምንጭ ሆኖ ያገኘሽው/ኸው አንድም ሆነ ከአንድ በላይ አማራጮች ላይ የጭረት (tick) ምልክት አድርግ/ጊ፡፡ ከተዘረዘሩት ውጭ የሆነ የመረጃ ምንጭ ካለ ከስሩ በተተወው ክፍት ቦታ ላይ አመልክት፡፡

| ቁጥር | የመረጃ ማግኛ አማራጭ | ጭረት |
|---|---|---|
| 1 | የተፈጥሮ አደጋዎች ወይም ከኢንቫይሮመንት ጋር የተያያዙ ችግሮች | |
| 2 | የመገናኛ ብዙሃን | |
| | 2.1 ሬድዮ | |
| | 2.2 የቴሌቭዥን ፕሮግራሞች | |
| | 2.3 Internet (የመረጃ መረብ) | |
| | 2.4 ጋዜጦች | |
| | 2.5 ሌሎች ካሉ ጥቀስ | |
| | 2.6 ፊልሞች (መቪስ)<br>2.6.1-የሀገር ውስጥ | |
| | 2.6.2-የውጪሀገር | |
| | ሌሎች ካሉ ጥቀስ …… | |
| 3 | መፅሐፍት<br>3.1 የመማሪያ መፅሀፍ<br>3.2 ልብ ወለድ ወይም ከመማሪያ መፅሀፍት ውጭያሉ መፅሀፍት | |
| 4 | ቤተሰብ | |
| 5 | በት/ት ቤት ውስጥ ያሉ የአካባቢ ከበባት (Env'tal club) | |
| 6 | ትምህርት (በክፍል ውስጥ የሚሰጥ ትምህርት) | |
| 7 | ከተፈጥሮ ጋር ያላችሁ ተሞክሮ (experience)፡፡ ይህ ማለት ተፈጥረአዊ ከሆነ ነገሮች ጋር የሚያገናኝ ሥራ፣ አጋጣሚ፣ ካለህ/ሽ እና ሥለ ኢንቫይሮንመንት ለማወቅ እንደ አንድ የመረጃ ምንጭ ሆኖ ካገለገለህ/ሽ፡፡ | |
| 8 | ከአካባቢ ጥበቃ ጋር በተያያዘ የሚሰሩ ተSማት ወይም ድርጅቶች | |
| 9 | በ?ደኞችህ/ሽ ምክንያት ወይም በሌሎች ሰዎች ተፅዕኖ ምክንያት (Eg.ተምሳሌት የሆነ ሰው (model) | |
| 10 | ከላይ ከዘረዘሩት የመረጃ ምንጮች ውጭ ካለህ/ሽ ጥቀስ/ሽ | |

**ክፍል ሶስት**

2) ከሚከተሉት በሰንጠረዥ ውስጥ ከተዘረዘሩት አማራጮች መካከል ለአንተ/ቺ ስለ አካባቢያችሁ ማህበረሰብ ስለ አካባቢያችሁ ተፈጥሮአዊ ጉዳዮች እና ችግሮች ከአካባቢያችሁ ጋር በተያያዙ ስላሉ ኢንቫይሮመንት ጉዳዮች እና ችግሮች ጥሩ የመረጃ የእውቀት ምንጭ የሆነህን/ሽን የመረጃ ምንጭ በጭረት አመልክት(አመልክቺ)፡ ፡ ከአንድ በላይ አማራጮች መጥቀስ ይቻላል፡ ፡ ከዚህ ውስጥ ያልተካተቱ ሌሎች የመረጃ ምንጮች ካሉ ከታች በተተወውላይ አመልክት/ቺ፡ ፡

| ቁጥር | ስለ የመረጃ ምንጮች | ጭረት |
|---|---|---|
| 1 | የክፍል ውስጥ ትምህርት | |
| 2 | በአካባቢ ላይ የደረሰ የተፈጥሮ አደጋ ወይም ተያዥ ኢንቫይሮመንታል ችግሮች | |
| 3 | በአካባቢህ የሚገኝ የመገናኛ ብዙሃን<br>3.1 ቴሌቭዥን<br>3.2 ሬዲዮ<br>3.3 ጋዜጣ<br>3.4 ፊልሞች (local) (የሀገር ውስጥ)<br>3.5 ሌሎች ካሉ ጥቀስ<br>…… | |
| 4 | ቤተሰብ | |
| 5 | መፅሀፍት<br>5.1 የመማሪያ መፅሀፍ | |
| | 5.2 ልብወለዶች እና ሌሎች ኢ-ልቦለድ መፅሀፍት | |
| 6 | በአካባቢ ጥበቃ ላይ የሚሰሩ ድርጅቶች (ከኢንቫይሮመንት ጋር በተያያዘ) | |
| 7 | ከተፈጥሮ አከባቢህና ከምትገኝበት ማህበረሰብ ጋር በምታደርገው እንቅስቃሴ | |
| 8 | ደኞችህ እና ሌሎች ሰዎች (role model) | |
| 9 | ሌሎች ካሉ ጥቀስ/ሺ<br>…… | |

3) በምትኖርበት/ሪበት አከባቢ እና ማህበረሰብ ውስጥ ተፈጥሮአዊ እና ሰውሰራሽ የሆኑ ከኢንቫይሮመንት ጋር የተያያዙ ችግሮች ካሉ የምታውቀውን/ቂን ዘርዝር/ሪ፡ ፡

ለ ምሳ ሌ፡ - ድር ቅ

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……

……

4) ኢ ት ዮ ጵ ያ ው ስ ጥ ተ ከ ስ ተ ው ከ ነ በ ሩ ት ተ ፈ ጥ ሮ አ ዊ ወ ይ ም ሰ ው ሰ ራ ሽ ከ ኢ ን ቫ ይ ሮ መ ን ት ጋ ር የ ተ ያ ያ ዙ አ ደ ጋ ዎ ች ው ስ ጥ ዋ ና ዋ ና ዎ ቹ ን በ ዝ ር ዝ ር ጥ ቀ ስ /ሺ

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……

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5) ከ አ ካ ባ ቢ ጥ በ ቃ ጋ ር በ ተ ያ ያ ዘ እ ን ቅ ስ ቃ ሴ አ ድ ር ገ ህ ታ ው ቃ ለ ህ ካ ለ የ ሚ ከ ተ ሉ ት ን ጥ ያ ቄ ዎ ች መ ል ስ ፡ ፡

ሀ ) ም ን ዓ ይ ነ ት እ ን ቅ ስ ቃ ሴ ዎ ች ላ ይ ነ ው የ ተ ሳ ተ ፍ ከ ው

……

ለ ) የ ት ነ ው የ ተ ሳ ተ ፍ ከ ው

……

ሐ ) የ ት ኛ ው አ ካ ል ወ ይ ም ተ Sም ነ ው የ አ ካ ባ ቢ ጥ በ ቃ ፕ ሮ ግ ራ ም ያ ዘ ጋ ጀ ው

- በ ት ም ህ ር ት ቤ ት ነ ው
- በ መ ን ግ ስ ታ ዊ ባ ል ሆ ነ ድ ር ጅ ት በ ኩ ል ነ ው
- ወ ይ ስ ሌ ሎ ች ……

6) ከ ም ት ማ ሩ ት ት ም ህ ር ት ው ስ ጥ የ አ ካ ባ ቢ ጥ በ ቃ ን ወ ይ ም ኢ ን ቫ ይ ሮ መ ን ት በ ተ መ ለ ከ ተ የ ት ኛ ው የ ት ም ህ ር ት ዓ ይ ነ ት ጉ ዳ ዩ ን በ ተ ሻ ለ መ ል ኩ ያ ቀ ር በ ዋ ል ፡ ፡

- ኢ ን ግ ሉ ሽ

- ባ ይ ሎ ጂ

- ጂ አ ግ ራ ፊ

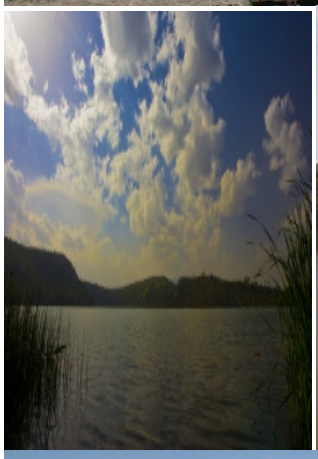
- ፊ ዚ ክ ስ

- ኬ ሚ ስ ት ሩ

- ወ ዘ ተ …(ሌ ላ ካ ለ ጥ ቀ ስ /ሽ )

## 8.8 Appendix 8

A glimse of sample pictures of some of the crater lakes that suround the city of Bishoftu(Debre Zeith)



## 8.9 Appendix 9

Sample partial views of Addis Ababa particularly slum areas